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ABSTRACT

Based upon the assumption that the teacher is the single most important factor in the development of reading skills, this volume provides information concerning different aspects of why citizens need to read and how teachers can aid in this process. Included in "why to read" are insights into the multifaceted aspects of communication, the influences of success and failure on self-development, and the selection and evaluation of children's literature. Included in "how to read" are insights into the English language; children's cognitive development; the teaching of word attack skills; and assessing, evaluating, and fostering comprehension development. (JM)

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insights into why and how to read

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Foreword

Based upon the assumption that the teacher is the single most important factor in the economic development of reading skills, this volume provides information concerning different aspects of WHY citizens need to read and HOW teachers can aid in this process.

The appreciation of the Association for this major contribution is expressed to Dr. Robert Williams, who edited these papers which were presented during the Nineteenth Annual Convention of the International Reading Association. Deep gratitude also is expressed to each of the authors. Both editor and authors made this contribution while they fulfilled already overburdened professional commitments.

Millard H. Black, *President*
International Reading Association
1973-1974

Introduction

"The Teacher: Key to Excellence in Reading" was the theme of the International Reading Association's Nineteenth Annual Convention held in New Orleans in May 1974. Much research from the past several years indicates that it is futile to search for the one best method or system or approach or material for teaching reading to all children. There is none. Research has found consistently that the single most important and significant variable in the teaching/learning situation is the *teacher*: how he sees himself, what he believes about other people, what his purposes are, and his empathy. The teacher is the key to excellence. But while it is important that we recognize the humanness and uniqueness of each student and each teacher, we must also be concerned with the teacher's knowledge and insights.

Insights into Why and How to Read was developed from papers presented at IRA's New Orleans Convention. The authors of this volume offer various insights into why and how to read. Included in *why to read* are insights into the multifaceted aspects of communication (Dale), the influences of success and failure on self-development (Whitcombe), and the selection and evaluation of literature (Huus). Included in *how to read* are insights into the English language (Shafer, Walker); children's cognitive development (McKenzie); the teaching of word attack skills (Shepherd, Hillerich, Cohen); and assessing, evaluating, and fostering comprehension development (Chesler, Taschow).

Insights into Why and How to Read is not offered as the final word, or even a major milestone, in the accumulation of knowledge but as a stimulus to extend insights so that the teacher—the key to excellence—may work more effectively in the teaching situation to meet the special needs of students.

RTW

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The International Reading Association attempts, through its publications, to provide a forum for a wide spectrum of opinion on reading. This policy permits divergent viewpoints without assuming the endorsement of the Association.

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Insights into Why to Read ■ ■ ■

Communication

Teachers must continue to stimulate the entire communication process: speaking and listening, writing and reading, visualizing and observing.

Reading as Communication

EDGAR DALE

THE OHIO STATE UNIVERSITY

If you had been walking the streets of Athens around 400 B.C., you would have met a man earnestly asking questions and questioning answers. This was Socrates who stated and argued about two of the biggest ideas in the world: "The unexamined life is not worth living" and "No man *knowingly* does evil." Socrates promoted discussion by reasoning from particular facts and examples to the general idea. He had no professorial rank, he didn't publish, and he was put to death for his challenging ideas.

About a thousand miles away and 400 years later there lived another man, Jesus, who also taught by specific illustrations, by metaphors known as parables, and by example. He didn't publish either but he was a master teacher, a sensitive observer, and a thoughtful listener. His disciples listened and discussed. He stirred up the people with a doctrine of love for all including one's enemies. He was crucified.

Let's turn to a third man, Thomas Jefferson, who was a great teacher, the third president of the United States, and author of the Declaration of Independence which was adopted almost 200 years ago and whose bicentennial we celebrate July 4, 1976. The Declaration was a revolutionary document penned by a great man who was also a great reader. Jefferson wrote that "all men are created equal." He was also a great advocate of education, including the State University. He wrote, "If a nation expects to be ignorant and free . . . it expects what never was and never will be." Jefferson was a reader and a writer, a speaker and a listener, a sensitive and intelligent analyst and observer.

Now let us move to the present and see how we have fared. The conflict between ignorance and wisdom is still on. H. G. Wells, a superb

teacher, wrote in *Outlines of History* in 1920: "Human history becomes more and more a race between education and catastrophe." Will education win? It is hard to say. Let us not forget that, even today, about half the people in the world cannot read or write; in some countries in Africa and Asia, the number runs as high as 90 percent. Will these "huddled masses yearning to be free" remain silent when faced with the famine predicted by Robert McNamara (head of the World Bank) who recently said that if aid isn't increased, "there are going to be millions of people dying in the world"? McNamara also noted: "800 million of them live on, in our terms, 30 cents a day and are barely on the margin of life."

The 1974 IRA convention theme, "The Teacher: Key to Excellence in Reading," suggests that great teachers can provide ideas and models of excellence which have powerful effects. Or, as Victor Hugo wrote: "There is one thing stronger than all the armies of the world, and that is an idea whose time has come."

According to Toynbee, three hundred years from now the twentieth century will not be remembered for its wars, conquest of distance or disease, nor for splitting the atom but for having been the first age since the dawn of civilization in which people dared to think it practicable to make the benefits of civilization available to the human race.

To provide these benefits, there must be access to excellence and this can only come through using all the available forms of communication: reading and writing, speaking and listening, visualizing and observing.

Communication and Reading

Let me note what I mean by communication and by reading. First, I define communication as the sharing of ideas and feelings in a mood of mutuality. This is derived from John Dewey who says, in *Democracy and Education*, that "communication is a process of sharing experience till it becomes a common possession. It modifies the disposition of both parties who partake in it." The effect is "the improvement of the quality of experience." These definitions suggest that effective communication is a two-way interaction in a mood of mutuality, that to communicate is to partake—to take part in a joint activity, not merely to inform but to transform.

I define reading as putting meaning into printed symbols in order to get meaning out of these symbols. As a reader, a listener, or an observer, you share ideas and feelings with a writer, a speaker, or a visualizer.

You can see the obligation that my definition of communication imposes on reader and writer, on speaker and listener, on visualizer and observer. Communication then becomes explicitly or implicitly a kind of dialogue, an interaction, in which we bring our life experiences to bear

in the solution or clarification of a problem. We become searchers for new ideas, not propagandizers of unexamined prejudices.

Reading should be seen as language development which can be classified basically as the producing and consuming of messages. We *produce* messages by writing, speaking, and visualizing. We *consume* messages by reading, listening, and observing. Hence, we have the basic pairs: reading and writing, speaking and listening, visualizing and observing. I shall refer to these pairs as dyads.

The Reading-Writing Dyad

Reading is the consuming part of the reading-writing pair. It involves the interpretation of a message usually written by someone else. Too often we think of reading materials as messages in a textbook designed for students. Only rarely is there an overratching feeling of communicating with a live author. When I spoke to high school students in reference to my texts, *How To Appreciate Motion Pictures* and *How To Read A Newspaper*, they were surprised to see a live author in their classroom. One girl said, "I thought textbook writers were dead."

Do your students think of a book as a personal letter from an author? When they read Isaac Azimov as a scientist, do they think of him as a real man writing a message to them? Do they ever correspond with the authors of their books, sometimes writing a letter of appreciation or asking for clarification? Newspapers and magazines often have a "Letters to the Editor" column to which readers can respond. But how can the reader respond to a textbook except to memorize it or perhaps evaluate it in class?

If we saw the reader-writer dyad more clearly, I believe that textbooks would become more readable. Too often, text materials do not fit the prospective reader and learner. And since in the typical seventh grade there is probably a range of six or seven grade levels, the problem of tailored communication is a difficult one. Readability formulas, wisely used, can help make reading materials easy-to-read at the intended level.

Further, all texts, encyclopedias, and reference materials should be field tested to see whether they are really readable. When we talk about the right to read, we ought to talk about the right to read readable materials. Indeed, perhaps the most important thing we could do to improve the quality of reading would be to provide interesting and comprehensible reading materials.

As teachers of reading, we ought to be very much concerned about what makes books, pamphlets, and articles readable or unreadable. They are sometimes unreadable because the author may be writing not to express but to impress. Some books are almost dull enough to be considered scholarly. We are afraid of simplicity, fearing it will be

judged as simplistic. We assume that children and youth know the hard words we do; obviously, they do not. For example, young people may not know about Sodom and Gomorrah. Few adults under fifty know the meaning of *prox*.

Here is how some textbook writers would change these common sayings: "All that glitters is not gold" would become "It is not inappropriate to know that all articles which coruscate do not necessarily possess a high intrinsic value." "Early to bed and early to rise, makes a man healthy, wealthy, and wise" would become "Early retirement is a significant factor in one's physical development, pecuniary success, and intellectual stature." Caesar wrote: "I came, I saw, I conquered." Translated into professional jargon this becomes: "Having arrived at my destination, I surveyed the situation and effectively overcame all obstacles."

This kind of writing was called "gobbledygook" by Maury Maverick. It abounds in government writing. A good, inexpensive pamphlet titled *Gobbledygook Has Gotta Go* can be purchased from the Government Printing Office for 55 cents.

The Listening-Speaking Dyad

I have talked about reading and writing as one pair, one dyad in a producing-consuming process. A second dyad is that of listening and speaking. In the first six years of their lives, children learn to listen and speak so well that they master at least 3,000 words and the syntax involving these words, the grammar. Basil Bernstein, of London University, has pointed out that in the low income groups the language of parents tends to be more staccato, less explanatory, and less complete; the syntactical fluency is missing. To learn a language, children must have a chance to talk and listen. They should be seen and heard. A child of a talkative mother said, "Mother, your ears aren't getting much practice today."

The poor live circumscribed lives and have circumscribed vocabularies. Hence, the importance of having children hear and talk about interesting experiences. Is there a lot of good conversation in your life and in the lives of those you teach? Good listening and speaking improve reading. Could you double the listening and speaking elements in the lives of your students? This would sharply improve their reading. Some children ought to speak and listen three to four times as much as they do now. Are you talking too much and listening too little?

Nearly everybody will learn the names or labels of the common things in life. You must do so to survive. But the higher you go in learning words, the more symbolic the words become, the more you must carefully listen to or read the indicators: the *however*s, the *therefore*s, the *and so forth*s, and the expressions such as *on the one hand* and *on the other*

hand. In short, as the child moves to more complex language there are more complex indicators of what is to come. And in reading we must be able to predict what is coming. A good predictor is a good reader.

To learn well you must listen critically and you must also speak critically. Children become more conscious of the flow of language when they learn poetry or participate in drama. To do complex listening, they must become aware of critical phrases and indicators. If we can speak complex language, we can read it and vice versa. This is language development, the development of linguistic competence. Furthermore, by speaking we learn to pronounce certain words, hence become familiar with them and the surrounding context. Using the tape recorder can help growth in speaking and listening. It builds vocabulary. So do many of the electronic media. Good readers can detect mispronunciations and linguistic errors: I had to bear the *blunt* of it. It will *wet* your appetite. It was a *fragrant* violation of the law. (Evidently it smelled.) The book was fair to *midland*.

Careful listening and reading will enable individuals to hear and know the difference between blunt and brunt, wet and whet, mitigate and militate, basilisk and basilica, ingenious and ingenuous.

A young woman approached President Hutchins of the University of Chicago after a lecture and said, "You were simply superfluous. I've never heard such an enervating speech."

"Thank you," President Hutchins replied, "I'm thinking of having it published posthumously."

"Wonderful," replied the young woman, "and the sooner the better."

The Visualizing and Observing Dyad

A third dyad is that of visualizing and observing. Many of us go through life with blinders on our eyes. We may see what is straight ahead of us but we don't have peripheral vision. By visualizing, I mean creating varied forms of imagery including the three-dimensional plastic arts. I mean painting, charting, drawing, photographing, sculpting, use of videotape recordings—opening up a whole new range of meanings. By this image-making, creative process we try to teach the student not only how to see better but to see *into* and to see *through*.

Many people lead dull, circumscribed "lives" because they have not learned to look freshly at life. They do not seek out and observe the different or the unusual; hence, they observe only what their naive, unsophisticated habits of observation permit them to see. They see only what they know. Shallow observing means shallow percepts and shallow concepts.

Observing as a means of communication is not adequately seen as a mode of language learning. Hans Selye, a Canadian scientist known for

his concept of stress, has emphasized the importance of personal observation as a necessity for creative inventive behavior. In *From Dream to Reality*, Selve states "The more we rely on complex instruments, the more the faculty of observation tends to atrophy. It is well to train the young scientist to acquire the habit of carefully observing the clinical behavior of his animals and of making meticulous autopsies with special emphasis upon 'peripheral vision' by the systematic search for changes that are not expected. . . . The talent to see likeness in the midst of difference—and, more important still, difference in the midst of likeness—is the basis of all classification."

The intelligent observer has an eye for the unusual, a mental set for serendipities. Only the disciplined observer can see the unusual in the obvious. This is also a realistic definition of a creative person.

To create this visual literacy (and schools and colleges neglect it) we recognize the importance of *reading* the pictorial material found in reference books, the importance of maps and the ability to interpret them. Some maps are hard to interpret because they contain too much material; they are overloaded with labels. However, merely being in the presence of some of these visualizations does not insure that we study and understand them.

Some visuals require careful study. It's one thing to understand a slapstick cartoon that appears in the typical daily newspaper, but it's quite another thing to understand a subtle, critical photograph or drawing that appears in a magazine, a *New Yorker* cartoon, for example. How much practice do we give in reading cartoons?

We all know what a seeing-eye dog is, but what is a seeing-eye man, woman, or child? A person with a seeing-eye has learned to observe. Not only is he aware of the actual visual details of what he is looking at but he is also aware of the things and events that preceded and followed them. He thinks contextually.

Most of you are familiar with crippled Christina who appears in a number of Andrew Wyeth's paintings. Those of us who have been fortunate enough to see these paintings in their original setting in Cushing, Maine, can add many more meanings to them. What we are trying to do in all aspects of communication, whether by reading or listening or observing, is to increase the breadth and the depth of language experiences. And every time we do this, we improve the quality of our reading. Reading is, after all, an integrated element of a larger communication process. The good reader is linguistically competent; he is learning how to learn a language.

One of the key ways to master language and to enhance reading is through drama. The term *drama* is from the Greek and means to act or to do. Drama is a visualized explanation of an idea. We observe and we do. In observing drama, we participate as committed spectators who are

empathetic with the characters on the stage and, as pointed out by Tennessee Williams, we learn that "men pity and love each other more deeply than they permit themselves to know." Drama read, listened to, or viewed communicates this to us.

On the stage, time, events, and speeches are shifted and foreshortened. Hence, there is not only an abstracting process but its reverse—the particularizing of a character. For example, meeting a typical salesman doesn't cause us to observe him carefully. However, Willy Loman, the specific, particular salesman in *Death of a Salesman*, makes us look and think.

Communication and the Higher Mental Processes

One of the great challenges to the schools is that of shifting our curriculum outcomes from mere memorizing to thinking, from duplication of the text to inquiry and discovery. These are the higher mental processes as contrasted with the lower mental processes. How do we apply this idea to reading?

To duplicate what someone else has said, to imitate his words or actions, is usually a lower mental process. This is *reading of the lines*, a literal response, learning by rote. It is useful for giving directions in manuals, recipes, and memoranda; but its possible range of application is limited. It tends to be training rather than liberalizing education.

A higher mental process deals with *reading between the lines*, drawing implications from what has been read. Here we often use the conjunctions of inference—*thus, therefore, consequently*—which signal coming inferences and require higher mental processes. Note how conjunctions of *contrast*—such as *on the other hand*—or conjunctions of *qualification*—such as *unless* or *providing*—require the reader to hold much more of the reading content in mind as he ties premise or introductory data to a conclusion. All fresh metaphors involve an inference, the use of higher mental processes, for example, feline, canine, leonine, vulpine, asinine, hircine. Each has an implied *like* in the *ine* ending.

Third, a still higher mental process in reading involves taking both literal and inferred meanings and applying them, often in the solution of a problem. Much thoughtful reading is of this type. The reader may answer the implied or expressed question, "So what? What difference does this fact or inference mean to me?"

We have, then, a threefold approach of increasing levels of higher mental processes. What did the writer or speaker or visualizer say? What did he mean? How can I apply this meaning to the transforming of my own life?

If we want to change the typical communication in school or college

from duplication to implication and application (e.g., the higher mental processes), we must teach and test directly for it, emphasize the inquiry mode of learning, and diminish the emphasis on rote acquiring unintegrated facts.

If we want to teach for thinking, our teaching and testing must present problematic, unpredictable situations important to the learner—situations which he has not yet faced. Here lies a real opportunity for a revolution in communication, hence in reading. It is an educational revolution in which thinking is substituted for rote memorizing, inquiry for mere duplication.

How well are we doing it? Let me quote from Spencer (2), the British sociologist and a broadly educated man. The date is 1864:

The once universal practice of learning by rote is daily falling into discredit. All modern authorities condemn the old mechanical way of teaching the alphabet. The multiplication system is now frequently taught experimentally. . . . The rote-system, like other systems of its age, made more of the forms and symbols than of the things symbolized. To repeat the words correctly was everything; to understand their meaning nothing. . . . Along with rote-teaching, is declining also the nearly allied teaching by rules. The particulars first, and then the generalization, is the new method.

Reading as Valuing and Action

As we think about the improving of communication through reading and writing, speaking and listening, visualizing and observing, we raise the questions: What for? To what ends?

We must see reading and communication not merely as informing but also as transforming, not merely cognitive but emotional as well. Further, communication must be a two-way street. We speak but do not listen. We read but are unmoved. We observe crime on the streets and do not even bother to call the police. John Ciardi once said: "The ultimate sin of the mind is the failure to pay enough attention."

Further, people may know what to do but they do not do it. They have exercised their options as far as actual reading or information getting is concerned, but they do not have the will to act on what they have read. Unfortunately, some professionals do not put a high value on action. They talk about action, they may even join an action group, but they do not act.

This pervasive problem of apathy and inaction is described by John Gardner (1), former Secretary of Health, Education and Welfare who now heads the Common Cause movement: "We know our lakes are dying, our rivers growing filthier daily, our atmosphere increasingly

polluted. We are aware of racial tensions that could tear the nation apart. We understand that oppressive poverty in the midst of affluence is intolerable. We see our cities sliding toward disaster. Yet we are seized by a kind of paralysis of the will. It's like a waking nightmare."

Reading is for Work and Play

The planned development of concepts in various fields of learning needs serious attention. But we may neglect the lighter side—the element of gaiety and humor that promotes language development, hence reading ability. Horace, the Roman poet, suggested that we instruct with delight. Delight is from the Latin *de licere*, meaning to entice. The *de* is an intensive prefix, so delight involves an intensive enticement.

Delight doesn't always come through humor or through play. It may come as the result of success achieved through learning something hard, just as professional success might come through the grueling practice in mastering ballet. Success is its own best reward whether in mathematics, ballet, or reading.

The delights of appreciation can also be sought as outcomes of successful reading. To appreciate is "to enjoy with understanding."

I would like to say a word for the pun—a play on words, a linguistic serendipity. Its wide appeal is shown by the fact that it is defined as a play on words in French (*jeu de mots*), in German (*wortspiel*), and in Spanish (*juego de palabras*).

But the pun is not everyone's cup of tea. As early as 1729, one man wrote: "He that would pun would pick a pocket." I like *Focus* as the triple pun name of the cattle ranch where the *sons raise meat* (suns, rays, meet). But some may balk at the triple pun on the bride and bridegroom thinking different thoughts as the wedding march starts: *aisle, altar, hymn*.

I enjoy the definition of the supervisor as a person who appraises with faint damns, and of the name-dropper as a person who suffers from allusions of grandeur. But I think that author Ben Hecht was fabricating when he said that the ailing Greenwich Village poet asked for a flaxseed poultice and got a flaccid poetess for his pains. Streaking has uncovered puns as well as shapes. Some say that streaking has bottomed out, that it is asinine.

Riddles are often puns. Thus the ancient reply to the question, "Why did the chicken cross the road?" has shifted to "For some foul reason." And the current one is, "Because Colonel Sanders was chasing it." Or, "Why did the cannibal make a mistake in boiling the missionary?" "He didn't realize he was a friar."

Reading as Vocabulary Development

The able reader, whether teacher or student, knows words, respects words, and occasionally falls in love with them. Emily Dickinson put it this way:

A word is dead
When it is said,
Some say.
I say it just
Begins to live
That day.

You have heard the expression "mere words." Perhaps there are some sterile words, words lacking motion, hence emotion—but reading is important because words and the sentences they make are more than mere. Interestingly enough, *mere* originally meant pure.

Sometimes words just die—they are no longer used. Examples are prexy, eftsoons, catarrh, 23-skidoo, or crupper. Sometimes words become lifeless due to overuse; they become clichés. I would like to sit in on a wake of such words as scenario, facet, viable. Some words become overinflated with pomposity and need to be deflated. Or they tell lies and lose their original meanings. For example, credibility now seems to mean what you can fool people into believing. Communication depends on trust. When we trust people, we also trust their words. If their words are phony, they are phony.

There are some beautiful words in the English language: *serendipity*, *synergy*. There is the word *family*. The origin of the word family is *servant*, suggesting that in a family we serve each other. Is a school a family? A class of twenty-five students? Is *in loco parentis* now a dead expression? Some years ago we had an international exhibit called "The Family of Man." I saw it in Tokyo and so did thousands of entranced Japanese. It helped us see ourselves as members of the human family. Abraham Lincoln often used the lovely term, the family of man. We shape our words and then our words shape us.

In troublesome times like the present, teachers sometimes ask despairingly, "What can teachers do?" Teachers can communicate with one another, share their ideas and feelings in a mood of mutuality. They can explore and use many ways to get language development—reading/writing, speaking/listening, visualizing/observing.

Teachers can make much better use of visualizing and observing as one of the triads in the communication process. They can see the language possibilities in television, videotape, slides, study trips—all the media of instructional technology. Teachers can promote language development at the critical level of inference, judgment, and application.

They can actively promote critical reading, critical listening, and critical observing.

The International Reading Association can plan for the future of reading both domestically and internationally. As Toynbee suggested, we must not forget that the twentieth century will be known as the great century of sharing excellence throughout the world.

What can one person do? He or she can do what all fine teachers have always done. They can plant seeds that someone else will harvest, plant trees under whose shade they will never sit. In short, they can put in more than they take out, a quality which has always been their hallmark.

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2. Spencer, Herbert. *Education: Intellectual, Moral, and Physical*. 1864, 103-104.

Self-Development

This paper discusses the real costs of reading failure.

Overcoming Reading Difficulties and the Effect on Personal Development

IEELA M. WHITCOMBE

EAST YORK BOARD OF EDUCATION

TORONTO, ONTARIO

When I started school I felt as if I was in a room with lots of windows which looked out on my world. Each year I stay, it feels as if more and more blinds are being pulled down. I am increasingly being shut out of a world that my friends seem to enjoy seeing into.

This comment, made by a sixteen-year-old, suggests the increasing sense of alienation felt by the ineffective reader—one who, for whatever reason, cannot read well enough to understand and remember print at the level he is expected to work.

Real Costs of Reading Failures

The results of failure to learn to read are not confined to the obvious ones of low grades and limited options. For the teacher they represent an appalling waste of time, effort, and energy. For the student they represent, as Bormuth (1) describes it, "an irreplaceable fraction of his life, a fraction of his life that has value to him to the extent that he could be using it to produce other things that would also be satisfying to him." For society they represent the limited contribution the student might reasonably have expected to make because of his continued uncorrected failure. The dropout also adds a disproportionate percentage to the social burdens of welfare payments and crime. In an age when accountability is called for, who wishes to be held accountable for deficits such as these?

The real consequences are not half-measured by statistics of wasted time and money. They are measured in individual, human frustrations, in futile attempts at coming to terms with blighted hopes, and in the agonies of seeing oneself a failure in the use of one of the basic tools of communication with the world. Ennis (4) reminds us that,

The costs involved are great in terms of direct loss of productive manpower and even greater in the indirect costs of action—including costs from the welfare and prison systems, the two great nonremediers. But in human terms the loss is incalculable. Reading may not be the only way for people to use their history and literature to forge a strong social and personal identity, but it is one way and a way denied millions of people.

Modern technology has provided many other tools for learning besides books. Postman (8) may be convinced that the answer to the problem lies in achieving "multimedia literacy." But of obvious and immediate concern to us is that Postman's millenium has not come. As Fay (5) remarks, "while reading may not necessarily be a prerequisite for learning, it certainly is a prerequisite for successful living in our society." It is even more a prerequisite for successful living in our schools. There are thousands in our high schools today who have stumbled along the printed path with bruised and weary feet. We must ask if there is not something that can be done to turn that path into a road leading to personal fulfillment. If, in so doing, the electronic or other media can contribute something worthwhile to help us succeed, all committed teachers will be grateful.

Nonreading Adults

For those of us who can and do read, it is difficult to envision life as a nonreader, but to do so would help us measure the urgency of our task. Three actual encounters will illustrate the point.

A young man with a mixed French-English educational background came for help. His inability to read had caused him to drop out of school early. Nevertheless, his wit and industry had permitted him to do commendable work in the manual tasks demanded by his job in a factory. His success had brought a proposal from his firm to send him to a course in electrical technology so he could advance in his work. Imagine his dilemma. Happily, his need coincided with the need of a young paraplegic who desired to be useful as a tutor. Beginning with Laubach material (6), other basic material, and suitable texts on electricity, the paraplegic opened the door for the young factory employee to increase his reading ability and to accept his firm's offer. Even more interesting was his eager extension of reading to more self-fulfilling matter. We were moved by his comment, "For years I

bought the morning paper and sat on buses and subways folding and unfolding it, pretending to read. You can't imagine the thrill the first time I could read, "Weather: sunny. High 75." It was sunnier than they knew!" He is typical of millions who, in our rapidly changing technological era, will need to adapt to changing demands of their jobs and their reading abilities. Ennis (4) reminds us that "reeducation is necessary to handle the successive waves of illiteracy following each scientific and technological advance."

The second adult nonreader was referred by her family doctor. The young mother of three boys was near nervous collapse from the strain of hiding her inability to read as well as her first grader. She recounted what had been a traumatic experience of finally confessing to her husband her elaborate efforts to disguise her illiteracy. She represented the emotional cost of being unable to read. Her progress was rapid. She now shares her family's reading and is being educated along with them. Her doctor reports that no further medication is needed and puzzling physical disorders have disappeared.

The third nonreader was a very successful contractor. If satisfaction is to be found in the wealth that can buy the electronic media by which one can teach oneself in Postman's world, how does one explain this nonreader's request? Surreptitiously he relayed through several intermediaries a plea for someone to teach him to read. He personifies deeply hidden, but still latent, feelings of a lack of personal fulfillment in spite of financial success.

Nonreading High School Students

For those of us in the public schools, our main and immediate concern is with nonreaders still within our schools. They represent all age levels, every socioeconomic group, and many degrees of intelligence. The causes of their failure to read are as diverse as their personalities. It is important to remember that in many of our schools they represent both those who *cannot* read and those who *will not* read. In either case, the end result of not reading is not so very different. Indeed, when one seeks for ways of helping both types of students, finding the rather concrete tools which may help the first may be much less demanding than finding what will help the second. Helping the student who will not read demands all of our sensitivity and ingenuity in finding the key to unlock an interest strong enough to help him involve himself in meaningful reading. His noninvolvement indicates that, once he had mastered the mechanics of word recognition in learning to read, nothing significant happened to create interest, arouse curiosity, expand his horizons, challenge his capabilities, or give him a sense of personal fulfillment. No wonder

reading bores him. It is like spending ten years playing the Key of C over and over. He is a "Johnny One-Note" reader.

What are the consequences? They are evident in student apathy or bravado, hopelessness or belligerence. Students may masquerade under the stolid indifference of the passive or scream aloud in the destructive negativism of the visible troublemaker. None can deny that these students are among the large number of dropouts.

It is important to consider the special effect that not learning to read has on the teen-age student. While in elementary school, he might have compensated for his handicap by drawing more frequently on his immediate experience. In the intermediate years, what he studied began to move beyond his personal world in vocabulary and concepts. But here the teacher was a more immediate and abiding source of help. There was no big problem yet. Besides, hope survived that the magic could still happen. Next year one would surely learn to read!

Arriving in secondary school, this student found that everyone assumed that the magic had in fact happened. He was expected to be self-reliant in his search for knowledge. His day became a succession of assignments from six or seven teachers. Other students carried little books in which assignments were duly entered with the intention of later reference. His vision of hours of struggle with the first assignment left little enthusiasm even to copy down the rest. To seem disinterested and to feel despairing took no effort at all. His internal response too often went like:

You're a young man now so don't let the panic show. Shrug it off, if you can. If you can't, you'd better distract the teacher or the rest of the class so they may not notice. Whatever you do, don't let them put you where you'll have to face your inability to cope. Better show them you couldn't care less! Doesn't anybody see I can't do it?

Even the student cannot measure what it really means. The born blind cannot know how much color and beauty lie about them nor the born deaf know the full sweetness of the music of joy and laughter and love beyond the silence. Eastman (2) rightly observes:

My notion is old, totally unoriginal, and, I believe, absolutely valid. It is that literature renders, to the imagination, experience and so promotes self-awareness, sympathy, understanding, wisdom. Literature offers inexpensively the choices for which actuality exacts a higher, deeper price.

And literature, to use again the ancient word, is a mirror—not of potentiality but of actuality. It tells us of men and women, parents, children. It tells us of ourselves, the central facts. In hookey-playing Huck Finn, in exhibitionist Tom Sawyer, in ineffectual Walter Mitty, in howling Allen Ginsberg—in these and a thousand others I see, I know myself.

It is banishment or access denied I want to talk about now; people whose growth through literature is stunted, who fail to see in its mirrors or enter

its universes or partake of its banquet. For it is a fact—hard, bitter, and recognized—that many achieve literacy and stop, and that many achieve literacy, enroll in our guided tours of literature, and then, returned home, settle down illiterately before the television screen for the rest of their days.

We need to see the extent of each student's deprivation which he, himself, cannot measure.

Fortunately, increasingly more secondary teachers are aware and do care. The long-delayed and still little understood magic does happen; many of the former failures do learn to read satisfactorily. Classroom teachers and special reading programs are two factors which make for success and effect personal development.

Contribution of Classroom Teachers

Although we have not reached that Utopia where every teacher sees himself as a teacher of reading, more teachers, in all disciplines, are taking advantage of preservice, inservice, and professional help to learn what they can do about reading in their subjects. As they find out, they discover that they are more effective teachers with all their students.

Special Reading Programs

It is evident, however, that more time and effort must be spent on teaching reading than can be given by the subject area teachers. For both the nonreader and the reluctant one, special reading programs (probably extending from the English department) are needed.

There is a direct ratio, both in academic and personal terms, between the degree to which attention can be given to the individual and his success. By the time students reach high school, so many emotional and behavioural factors have become interwoven that group work tends to widen the gaps. Permit a personal experience. In a reading centre filled with a wide selection of print material or "software," cassettes, taperecorders, and pacers, we find it possible to offer significant help to students on strictly individual programs. To eliminate any stigma and because we believe we owe it to students, we also include material and work for top-notch students. Besides reading, part of each day's work is in writing and all students follow instructions in developing listening skills.

Success Factors

We should like to stress three factors which seem especially significant when considering work with high school students. These include accu-

rate, meaningful, diagnostic procedures; high teacher expectations; and a link with subject areas.

Diagnostic Procedures

The best possible source of information is the student himself. If he is treated as one whose opinion on the matter is of prime importance, he can present the most accurate clues for a suitable program. The student interview should become the occasion for the hopeful resurrection of those long-buried dreams and ambitions on which we must draw for the incentive and sustaining patience required in the very real struggle to which we want him to commit himself. The honest compliment you pay him is more significant than you can measure and can be the first step toward the commitment he makes to whatever effort is required. Similarly, in the choice and adjustment of program and material, it is vital that he be involved in the decisions.

Diagnosis needs to have dimensions much broader than a search for statistics. A suitable standardized test provides important objective data on which to base one's discussion with the student. To place any great significance upon grade level interpretation of its results is both unproductive and unreliable. Most of the reading the student wants to do fits no specific grade. Besides, his ability to read is now so affected by his background experience and his interests that it can range over several grades, depending upon content (7).

The use of an informal reading inventory can be most helpful but, again, not for establishing a grade level. Using paragraphs or selections from textbooks as a basis for the inventory, the sensitive teacher can derive information about the student's word attack and strengths and weaknesses in unaided response to what he reads (3). Observant attention to him as he reads will yield significant clues to his image of himself as a reader.

Teacher Expectations

Nowhere is the teacher's conviction and expectation that improvement will ensue more important than in the task of rebuilding confidence damaged by years of failure. No hypocrisy can be tolerated; here it would be both cruel and tragic. If the correct steps are taken, both teacher and student have a right to expect that marks will begin to improve. Improvement in self-respect and behaviour can be expected to follow.

Link with Subject Areas

To ensure that gains are carried over to other studies, frequent application to current assignments is recommended. Such linking also offers the chance to establish another crucial ingredient—the tailored, meaningful, consistent challenge which eliminates boredom, the curse of too many reading programs.

Such a view establishes some guidelines as to the approach taken and the materials used. Where possible, the basic skills of word attack, gaining meaning from context, levels of comprehension, and study skills are more effectively taught from selections in which the student can become interested. Here, his familiarity with the structure of his language and its meaning and his background knowledge of the content facilitate identification of unknown words. For instance, one of our more successful tools for teaching basic skills has been a reading and study guide written for the Automobile Association, *How to Drive*. One can insert specific work in more advanced skills which grow out of the difficulties encountered in such material. The prime concern is that every reading activity should be linked to meaning as closely as possible. For instance, we find *Reading for Understanding* (9) our best tool for vocabulary development of abstract and advanced words, since the words are studied to satisfy an immediate need.

Another guiding principle should be that whatever selection is being read, for whatever purpose, it should make a worthwhile contribution to the store of long-denied knowledge which the student must bring to each new reading encounter. Spelling out this principle to the student adds incentive to the immediate task. One nonachieving seventh grade student began by reading and discussing a selection on storms; this first step later led him into meteorological studies at the university.

Effects on Personal Development

Need we elaborate on the changes that occur, first within the student, and then in his responses to what are to him new opportunities to learn? Dreams long blurred take on new focus. In turn, new meaning is given to subject matter. Growing knowledge of his world and of himself expands into a curiosity about the lives of others, past and present. The blinds begin to go up at his touch. He has begun to acquire a basic ingredient for independence. Who would not want to be accountable for that?

Significance for Educational Authorities

We have no panacea and we do not achieve one hundred percent success. The problems, the students, and life itself are too complex for

that. If results are promising among even a fair proportion of our students in secondary schools, surely more widespread attention should be paid to the possibilities. What conclusions can we draw?

First, the work offers a challenge to our best teachers, those who can accept students with problems without abdicating their role of leadership. This requires opportunity for serious studies in all aspects of both language competency and human growth. We are only now beginning to provide this for secondary teachers.

Second, education officials need to consider both the need for and the possible parameters of credit programs which will provide the opportunity for maturing young people to learn what has previously eluded them.

Finally, boards of education and administrative personnel need to count the cost of freeing keen teachers to do this job. They should weigh the cost of implementation against the financial, social, and emotional costs extracted by accumulative failures. It seems insane to expand capital costs of buildings and equipment or to meet increasing expenditures for staff, unless we set free, to benefit from it all, as many as possible of those whose inability to read hitherto made our efforts seem in vain.

All we have said is summed up in the lovely poem of Virginia Svagr (10):

THE NONREADER

The boy I saw was seventeen.
He laughed; he talked
He seemed to see,
And yet he could not read.
So deprived was he
That all the world seemed flat and stale.

He came for help
To see as others see,
To find the splendor
That is there in print.

What to do with such as he?
If we but stop and think
And love and care,
We find the way.
To read, this boy must also love—
Himself, the book, the world.

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Literature

This paper explores several guidelines to consider when evaluating literature for children.

Evaluation of Children's Literature

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Literature for children is part of the ongoing stream of writing but just happens to be material children can read for themselves or can understand when it is read to them. Literature, which has been defined as the "writings of a period or country, especially those kept alive by their beauty of style or thought," (8) ought to include any topic or idea. Yet there are some people who would restrict it to works of the imagination.

Purposes of Evaluation

The evaluation of children's books as literature, which is the approach taken in this paper, proceeds through several screenings: first by author, editor, and publisher; then by purchaser; and last, by the user. Each views the book according to his own needs and purposes.

An author writes because he has something to say, or he may want to be heard on a certain topic and uses his writing for that purpose; he may write because it is his job, or just because he likes to write. Edward Ardizzone (1), a well-known British author-illustrator, says that he writes

... largely to amuse that childish part of myself. I am afraid this is an awful confession to make, but alas I am not only incorrigible but also unrepentant, and so will go on concocting new works merely for the fun of it.

An author chooses his own topic, unless of course he has been asked to "do" a book on a specific subject, but even then he has the option of refusing. His background of information and experiences, his level of

workmanship and taste, and his ability to discriminate, all influence his writing.

Before a book is published, the editor and publisher decide whether to publish what the author has presented and, if so, who will illustrate it, how much the finished book will cost, and where it will be distributed. The publisher hopes the book will sell and that it will win awards for excellence, for these prolong the life of the book.

The purchaser, who may or may not be the one who reads the book, may be choosing it for a specific individual or for a known group; he may be filling in a library collection, supporting curriculum study, or selecting a birthday present. He may be fortunate enough to be buying in a bookstore where he can peruse the book, or he may be ordering from a publisher's catalog containing a summary, or from a recommended list. If the buyer has a chance to examine the book, he will probably be influenced by the title, the recommendations and reviews quoted on the book jacket or blurb, and his prior knowledge about the author and publisher. He may also be influenced by the salesman, especially if the book is completely unknown.

The reader chooses books for entertainment and enjoyment, to gain information and insight, to solve practical problems, and to escape. He evaluates a book in terms of whether it serves his purpose, how difficult it is to read, and how interesting he finds it. The book's appeal is related more to the reader's chronological age than to his mental age and to his background of experience and reading ability. Some books have instant appeal to readers, for they relate to interests already developed; other books gain in appeal as interests develop.

Elements of Quality

As writers, editors, purchasers, and readers look at books, what elements of quality do they seek? Three obvious aspects are format, content, and style.

Format relates to the way the book looks: its design and make-up, print and illustrations, size and shape. When picking a book from the bookshelf at home, browsing in a bookstore, or choosing a library book, many individuals are first attracted to a book because it looks inviting. The bold, striking colors of the illustrations by Brian Wildsmith, the delicate, grayed colors of Arthur Rackham, and the soft, clear tones of the D'Aulaires entice readers to pick up their books and delve into them. While color is certainly a drawing card, long-time favorite books like Wanda Gag's *Millions of Cats* and Lynd Ward's *The Biggest Bear* do not depend upon color for their appeal. The artistic elements of line, form, balance, and movement, plus a subtle feeling-tone are evident, even though the pictures are in black and white.

The appropriateness of color, technique, and medium to content is well exemplified in the works of Marcia Brown, who varies her interpretation according to the content of the material. She chooses vague lines and soft pastel pinks and blues for her *Cinderella*, linoleum cuts in sharp black and a kind of mustard brown for *Dick Whittington and His Cat*, bright, clear blue and earthy tones of purple and red-brown for *The Three Billy Goats Gruff*, and woodcuts in rust and jungle green for *Once a Mouse*. Each technique and color range superbly fits the subject and locale.

Format also includes such aspects of bookmaking as paper, print, spacing, and binding. The American Institute of Graphic Arts made the following criticisms of some of the books submitted to the jury for inclusion in their Children's Book Show (2):

In many cases books were overdesigned, especially in the use of color; where color was necessary and appropriate on one page, merely because it was available it was often imposed on another to the detriment of the book as a whole. Often, the best efforts of the illustrator and designer to create a beautiful book were offset by poor printing, lack of planning for side-sewn bindings, and inappropriate binding designs. The common practice of repeating an inside illustration or the jacket drawing on the cover of the book was especially deplored by the jury. Book jackets, too, often lacked imagination in design and failed to reflect the concept and unity of the inside of the book.

Roger Duvoisin (3), author and illustrator, describes what illustrations can do for a book:

One of the reasons for making a page which is well designed is to tell the story with more simplicity, more verve, clarity, and impact; to give importance to what is important; to eliminate what destroys the freshness, the originality of the page; in other words, to make a page which will be more easily read by the child. A well-designed page will also educate the child's taste and his visual sense. A beautiful book is a beautiful object which the child may learn to love.

Hopefully, the reader's ability to recognize superior format will improve with increased contact with beautiful books, and as he learns more about art and its principles, he should gain in his ability to justify his choices.

The second element of quality is *content*. With children's stories, this involves the evaluation of theme, setting, plot, and characters, just as stories and novels for adults are evaluated.

Theme relates to the overarching idea, the main point of a work. Asking "What is the book *about*?" may help define theme, but its evaluation requires an appraisal of its worth. Quality can be determined by comparison with criteria, and the ultimate criteria remain the

traditional "good, true, and beautiful." To be considered "good," a theme will likely coincide with the values of the appraiser; for example, kindness over violence, good over evil, honesty over dishonesty, and so on. To be "true," a theme must be accurate and real so that, given the conditions in the story, the results are corroborated: the setting looks the way the description depicts it, the characters act like people one knows, and the actions are realistic and plausible within the context of the story. To be "beautiful," the appraiser's standards of beauty must be defined and applied. These ought to conform to what is acceptable by well-known artists who have helped set the standards.

As an example, the theme of the *Three Billy Goats Gruff* might be stated as good triumphing over evil, but it might also be interpreted as passing the buck to the one who is the biggest! In appraising the theme of this folktale, values would include the idea of the larger protecting the smaller and weaker, the rightness of goats to go across the bridge to get food, the wrongness of the troll to stop them or to eat them up, and the justification of removing the enemy so that the goats can eat and get fat because goats who are well fed produce milk for people.

Setting is evaluated according to its clarity and accuracy in describing the locale and the era in enough detail that the reader can easily visualize the scene. This short excerpt from *Hills End*, by Ivan Southall (7), describes the town after the storm had struck.

Hills End was half drowned. The great River Magnus submerged the flats and had even reached the mill and the McLeod's home. Part of the mill still stood, but the timber racks were down, scores of great logs had disappeared, a bulldozer was three feet deep in mud, the chimney stack was a grotesque heap of bricks, and the office had vanished. The mill was the life of Hills End. Now there was no reason for Hills End to go on living.

The main street was a battleground in which the town had tried to fight the storm and had lost. It was a battleground littered with ruins, with tangled roofing iron, shattered cement sheets, weatherboards, rafters, and sections of walls. Something crazy had smashed through the town, determined to destroy everything. That was how it looked. That was how it seemed.

Note the specific listing of debris, the comparison with a battleground, and the composite picture of destruction these two paragraphs make. Reality, vividness, and completeness are important if readers are to visualize the scenes. One elementary school child said she always read books as if they were movies, visualizing each scene in turn.

Plot is the story, the conflict or problem and the actions leading toward its solution or resolution. Excitement and suspense are created when the result is in doubt, when danger is imminent, when time is running out. Though problems vary in severity and intensity, evaluation

involves the logic of the steps toward solution in relation to the nature of the problem, plus the tensions created. When the children return to the devastated Hills End, their problems of survival at first seem insurmountable. Yet, after they agree to a plan that Adrian formed, they all work and bring some order out of the chaos so that when the men return to the town, the children have proved that they could survive. The plot describes their step-by-step procedures: the plan gives everyone a job to do within the limits of his capabilities, a signal system is arranged for communication, and dangers are pointed out. Priorities are set, and everyone falls to.

To be convincing, characters must act true to their real-life or fanciful counterparts. Fairies must act fey: pixies and elves, sprightly; trolls, bumbling; and people, human. Clues to characteristics are found in what characters say and think and do, what others say about them, and how they are depicted in the illustrations. When these bits of information are combined, they give a rounded picture and the character is evaluated according to his fidelity to himself and his kind. Some characters remain fairly static as the plot unfolds, while others adapt and grow with their experiences—but each must be convincing.

The third element of quality in stories is *style*, the peculiar combination of words—the vocabulary and syntax—that conveys the author's ideas. Irene Hunt (4) maintains that

Style is the reflection of the writer's perceptions of life. It reflects his grace or lack of grace; his courage or his whining self-pity; his humility or his arrogance; his compassion or his cynicism. Think of the delicacy of Katherine Mansfield, the robust quality of Mark Twain, the gentle wistfulness of Kenneth Grahame, the blend of humor and wisdom of E. B. White, the sweet, prime morality and great warmth of Louisa May Alcott. Each has a style all his own; each one, perhaps unconsciously, describes his own personality.

Point of view, timing, and originality are important to style and give the writing its flavor and spice, its tone and mood. The sound of words, the rise and fall of the sentences, and the neat combination of ideas also contribute to style, as do figures of speech like alliteration, personification, and onomatopoeia.

The evaluation of style is based upon a recognition of its elements, an acknowledgment of their uniqueness, precision, and appropriateness to the topic, and an awareness of the imagery created by the combination. The level of language (from the vulgar to erudite), the feelings and emotions engendered, and the optimistic or pessimistic view of life presented, all relate.

Though historical fiction, animal stories, and fictionalized biographies deal with reality, they are measured against the same yardstick as stories

of the imagination, but the facts must be true. Straight, factual accounts of plants and animals or weather and stones, however, require adaptation of criteria, for the approach is nonfictional and no story as such is told. Instead, these books contain descriptions, explanations, and perhaps directions for experiments and other related activities. Applicable anecdotes may be introduced, but their purpose is usually to clarify or expand.

The format of nonfictional books is evaluated according to the same criteria as those of fiction, while the standards for content must, of necessity, emphasize accuracy and recency. Plot and characterization are omitted, but point of view and setting may apply.

Less adaptation of criteria for style is needed, because similar elements of sound and imagery characterize fine writing here, also. Clarity and sequence of presentation are emphasized and so are figures of speech, for a vibrant style will hold interest even when the account is merely descriptive. Robert McCloskey's description (5) of a hurricane is a case in point:

Gently at first the wind begins to blow. Gently at first the rain begins to fall.

Suddenly the wind whips the water into sharp, choppy waves. It tears off the sharp tops and slashes them into ribbons of smoky spray. And the rain comes slamming down. The wind comes in stronger and stronger gusts. A branch snaps from a tree. A gull flies over, flying backward, hoping for a chance to drop into the lee of the island. Out in the channel a tardy fishing boat wallows in the waves, seeking the shelter of Bucks Harbor.

Note the build-up of excitement, the wonderfully harsh short-vowel sounds, the comparisons and repetitions. The excitement is there, but the topic is weather.

A Final Word

A synthesis of the elements of format, content, and style follows their recognition and appraisal, and the total work is seen in perspective with the various aspects balanced against one another in a kind of *gestalt*, then viewed in comparison with other works of its type. The final judgment depends upon the critic's purpose, scale of values, level of taste, standards of perfection, and background of general information and of the children's book field. He then makes his decision and stands behind it, ready to support it when necessary. Time and the readers will determine whether he is right or wrong, but when he consistently seems to have judged well, his expertise is established.

Many children's books available today are beautiful, beautifully made, and beautifully written. Perhaps Isaac Singer (6) was right when he

declared that children's books hold the only hope for literature in our time. The implied challenge is clear: Select the best books and make them available to children.

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Insights into How to Read ■ ■ ■

Language

Reading and language teachers need to be aware of language universals while helping children acquire language and reading skills.

Universals in Language Acquisition and Reading

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Linguists are scientists contributing to a general science of human behavior. In recent years, the search for universal principles underlying a general science of human behavior has brought a new emphasis into the search for universals in language and increased cooperation with scientists in other fields such as psychology and sociology. As a result, new areas of enquiry, such as psycholinguistics and sociolinguistics, have emerged to place the study of language acquisition and development in new contexts. Amid these new contexts the search for the ways in which human beings develop meaning and thought, and the relationship of language to this development, is producing a veritable explosion of knowledge. It is important that teachers of language and reading become conversant with this new knowledge. If it becomes ultimately clear that there are universals which affect language learning, then learning strategies and materials which are to be developed in the future must necessarily take these universals into account.

Universals in Language

What are language universals? Psycholinguistics divides the study of language universals into two distinct types: those universals which are concerned with logical structure and those which are concerned with substantive content. Some universals are concerned with the logical structure of language such as those which might occur in the following categories.

Unrestricted universals includes not only the fact that all languages have

vowels but also that there are numerical limits to the features in natural languages. For example, in all languages, the number of phonemes is not fewer than ten nor more than seventy; and every language has at least two vowels.

Universal implications involves the relationship between at least two characteristics in a language. If a language has one characteristic, it is possible to hypothesize that it may have another particular characteristic but not vice-versa.

Restricted equivalents concerns the relationship between characteristics which are not universal. For example, if the language has a particular nonuniversal characteristic it may also have a particular universal characteristic. That is, if the language has a lateral click it always has a dental click and vice-versa. This example is found in languages from a restricted area of South Africa.

Statistical universals are concerned with the statistical probability of occurrence of certain characteristics of a language. For example, most languages in the world have nasal consonants; as far as we know, there are only a few that do not. Therefore we might say that, universally, the statistical probability of a language having at least one nasal consonant is greater than that it will lack nasal consonants.

Statistical correlations differs from the preceding in that it involves relationships among universals so that if a language has a particular characteristic it has a significantly greater statistical probability of possessing some other characteristic than if it does not possess the first characteristic. For example, if a language has a pronominal gender in the second person singular, it has a greater probability of having this distinction in the third person singular.

Universal frequency distribution concerns the ways in which redundancy occurs in a given language. If we found that for an adequate sample of languages there were certain characteristic means and standard deviations which would show similarities in the ways in which redundancy is accomplished in a variety of languages, we could consider these as universal facts about language.

Another way of classifying language is substantive classes of universals. This has to do with which area within language study the universal characteristic falls—lexical, phonological, grammatical, or semantic (7). Recent developments in generative semantics and language acquisition have tended to stress the fact that meaning is present in some universal sense at all points during the development of communicative competence.

A further discussion of the general concept of language universals would not be appropriate for this paper since it is of principal concern to note the ways in which language universals may function with respect to language acquisition.

Universals in the Acquisition of Language

Chomsky (4) proposed that the competence of the speaker-hearer can ideally be expressed as a system of rules that relates signals to semantic interpretations of those signals and further mastering competence in a language is a matter of mastering a system of rules as opposed to acquiring a set of dispositions to behave. Chomsky further proposed that human beings have an innate language acquisition device which, when triggered by the stimulus (language), accounts for the ways in which human beings acquire language. He also stated that the rules relating deep and surface sentence structure are so complex and abstract that a purely stimulus-response or association explanation of their workings is an inadequate explanation (3). Only by supposing a child has the form of grammar programed into his brain can we account for his intellectual feat in acquiring these rules. As Chomsky (5) puts it:

The competence of an adult, or even a young child, is such that we must attribute to him a knowledge of language that extends far beyond anything that he has learned. Compared with the number of sentences that a child can produce or interpret with ease, the number of seconds in a lifetime is ridiculously small. Hence the data available as input are only a minute sample of the linguistic material that has been thoroughly mastered, as indicated by actual performance. Furthermore, great diversity of input conditions does not lead to a wide diversity in resulting competence, so far as we can detect. Furthermore, vast differences in intelligence have only a small effect on resulting competence. We observe further that the tremendous intellectual accomplishment of language acquisition is carried out at a period of life when the child is capable of little else, and that this task is entirely beyond the capacities of an otherwise intelligent ape. Such observations as these lead one to suspect, from the start, that we are dealing with a species-specific capacity with a largely innate component. It seems to me that this initial expectation is strongly supported by a deeper study of linguistic competence.

Further, in their attempts to explain the innate language acquisition device, Chomsky and his colleagues have attempted to account for the nature of this device by developing a highly formalized system of precise rules which have been expressed in the so-called tree diagrams of transformational-generative grammar. Grammarians (many of them Chomsky's students) are attempting to write rules for all languages so that we may better understand how language works, to specify the nature of this language acquisition device and/or process, and to show the ways in which the learning of paralinguistic and linguistic behavior are also rule-governed. Their efforts are continuing in attempts to define such terms as *competence* and *performance*, to inquire into the nature of deep structure, and to write rules governing the learning of a first language in addition to those governing the learning of a second

language. The study of transformational-generative grammar has much to do with this since the language of transformational-generative grammar has become a meta-language for developmental psycholinguistics and other areas of linguistic studies. As Brown (1) has put it:

Though no generative grammar can reasonably be considered a model of the process of sentence production or comprehension (it is much more like a set of axioms for testing whether a given string is or is not a sentence), generative grammars have, as their ultimate point, a distinctly psychological goal. They are intended to represent formally the knowledge that the native speaker must *somehow* utilize in producing and understanding sentences. Insofar as a grammar has correctly captured this knowledge it does not seem unreasonable that the relative complexity of derivations will be a determinant of the order of this acquisition.

Reporting on more than a decade of research in child language acquisition, Brown proposes that children pass through certain stages where certain constructions develop. In the very earliest stages, a child is a seeker after meaning and actually supplies his own creative input in many language learning situations. In these language learning situations, Brown also notes that

The order of progression in knowledge of the first language, both semantic and grammatical, will prove to be approximately invariant across children learning the same language and, at a higher level of abstraction, across children learning any language.

Further, Brown proposes that the primary determinants of acquisition order will prove to be cumulative, consisting of both semantic and grammatical elements since the child is learning both simultaneously.

McNeill (9) proposed that

Not only do children acquire knowledge of sentence structure—itsself an important fact—but virtually everything that occurs in language acquisition depends on *prior* knowledge of the basic aspects of sentence structure. The concept of a sentence may be a part of man's innate mental capacity. . . . The facts of language acquisition could not be as they are unless the concept of a sentence is available to children at the start of their learning. The concept of a sentence is the main guiding principle in a child's attempt to organize and interpret the linguistic evidence that fluent speakers make available to him.

What Brown, McNeill, and their colleagues in developmental psycholinguistics are proposing is a hypothesis which seems remarkably close to that of Piaget but which is certainly based on the work of Chomsky. Basically, children work out the rules for the speech they hear passing from levels of lesser to greater complexity, simply because the human species is programed at a certain period in its life to operate in

this fashion on linguistic input. Linguistic input would be defined as those properties of language which trigger this learning process. The elements of the process itself seem to be as universal as other language universals. Errors made by adult second language learners of English need to be compared with the kinds of errors made by child language learners of English. In a recent study, Burt and Dulay (2) found that both Spanish speaking and Chinese speaking children between the ages of six and seven acquire the various structures of English with a 96 percent correspondence in order of acquisition. Although this represents a variation from that of a child learning English as a first language, the patterns of similarity in second language learners reported in this study are so far beyond the possibilities of chance that one must presume this to be a possible case for the operation of universals in second language learning.

Implications for Reading Instruction

Teachers must become more conscious of the fact that linguistic behavior itself is rule-governed and these rules are abstract and subconscious. As yet, we do not know what these rules are. Generally speaking, we have not tended to look at reading comprehension as, at least in some part, rule-governed behavior. In order to study the process of comprehension, it is necessary to know what has to be comprehended—that is, the actual linguistic content of any particular sentence—to know what rule-governed processes enter in the comprehension. That is, we need to know how that content is processed. Even mistakes should be thought of as applications of the wrong rules, as evidence of faulty processing rather than as instances of random behavior. The work that Goodman and his colleagues (6) have done in miscue analysis is an attempt to relate comprehension in reading to the ways in which children learn language.

One of the elements which is least understood in the development of fluency in language, particularly in the preschool and early school years, is the role played by parents, teachers, and peers. If language triggers language development, then context or environment may promote language development. Halliday (8) has pointed out the importance of social functions of language in the context of the child's life:

The social functions which language is serving in the life of the child determine both the options which he creates for himself and their realizations in structure. We see this clearly in the language of young children once we begin to think of language development as the development of the social functions of language and of a meaning potential associated with them. However, although this connection between the functions of language and the linguistics system is clearest in the case of the language of very young children, it is essentially, I think, a feature of

language as a whole. The internal organization of natural language can best be explained in the light of the social functions which language has evolved to serve. Language is as it is because of what it has to do. Only, the relation between language function and language structure will appear less directly, and in more complex ways, in the fully developed adult system than in children's language.

It may then be that, to the extent that parents, teachers, and peers can intervene appropriately in the experience of the child, an enriched social context for language development can be provided as well as general stimulation and supplemental forms of specific help. If we can learn to use productively the new insights from linguistics, we may be able to determine the appropriate ways and times to intervene and bring forth a new era in the teaching and learning of language and reading.

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The effectiveness of reading and listening processes is examined with a group of eleventh grade students. Areas for further research are explored.

Comparative Study of Selected Reading and Listening Processes

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One disconcerting aspect of reading research, if not of pedagogy, is that the exact area of investigation is often unclear. The precise domain of reading is not clearly delineated in terms of the activities and processes it embraces. Reading is a receptive language process; but so is listening. Reading is a thinking activity; but so are listening, speaking, and writing. In simple terms, reading is a unique activity insofar as it involves the visual reception and interpretation of information signaled by written language. However, apart from the obvious physical characteristics of reading, it remains uncertain what other covert processes are exclusively its domain so as to distinguish it from, for example, listening.

Lists and taxonomies of reading and listening comprehension skills are frequently similar, if not identical. Moffett (10) claimed that there is no such distinguishable thing as reading comprehension; instead, he maintained that there is a general process—comprehension—which applies equally to both reading and listening. While reading specialists would feel uncomfortable about this position, it is difficult to find data to refute it. Thus, while a commonsense argument could be made for the study of reading as reading, a case could also be made for its study within the wider perspective of language processing. As Brown (4) suggests, "... reading research is no longer an isolated field; indeed, its bounds have become a little difficult to define."

The purpose of this study was to illuminate some unique characteristics of reading using a strategy whereby the processing of written language was contrasted with the processing of spoken language in relatively mature subjects (grade eleven high school students).

Similarities between Reading and Listening as Language Processes

A review of the literature relating to human information processing, to listening, and to reading led to the adoption of a position which saw reading and listening as the two major subclasses of a larger class of human behaviour—language processing. This larger class was defined as the reception and interpretation of linguistic messages. Both reading and listening were seen as having common characteristics belonging to this larger category as a whole. The literature review indicated that these common features could be clustered around two closely associated principles of human information processing, cue sampling and message reconstruction.

Implicit or explicit in models of information processing is the principle that the organism does not receive and process all the sensory information which assails it (3, 12, 14). Even within a single set of sensory input being attended to, the total information contained in it is not utilized in its processing. Information processing is, therefore, a matter of cue sampling, or selection from the total display. Closely associated with this principle is a second one which regards information processing as a reconstructive activity in which the meaning of the original message is actively recreated by the receiver from the partial cues or fragments received. Neisser (11) compared the reconstructive nature of cognition to the activity of the paleontologist who, through the use of a few bone chips, is able to reconstruct a model of a prehistoric dinosaur.

There is considerable support in the literature for the application of these principles to the processing of linguistic messages, both spoken and written. The fact that language is a structured system of linguistic units and rules by which these units can be combined into permissible utterances means that it contains considerable redundancy. This in turn means that the receiver does not need to attend to every single letter, word, or phrase cue in an utterance in order to reconstruct its meaning. Thus reading and listening can be considered as cue sampling activities. They are also reconstructive behaviours so that the meaning must be recreated in the receiver's mind from the partial linguistic information processed.

In the area of listening research, support for the application of the principles of cue sampling and message reconstruction can be found in the analysis-by-synthesis theory of speech perception proposed by Halle and Stevens (6), in the work of Neisser (11), and in the writing of Hochberg (7). In reading, the principles are implicit in the psycholinguistic theory of Goodman (5); in the research reported by Wanat (16) and Kolars (8); and in the models proposed by Mackworth (9), Roberts and Lunzer (13), Venezky and Calfee (15), and others.

As language processes involving cue sampling and message recon-

struction, reading and listening have much in common. The question posed in this study was whether there is any difference between the two in the operation of these principles.

The listener register (a term referring to types of language dependent upon situation) selected for comparison with reading was one form of spontaneous speech, unrehearsed discussion between pairs of articulate grade eleven students recorded on videotape.

Spontaneous speech differs in several respects from formal writing. A pilot study revealed that the spontaneous speech of grade eleven students, identified by their teachers as articulate individuals, contained considerable extraneous material. This included audible pauses like "em" and "er", filler words such as "you know" and "like," and mazes (incomplete grammatical sequences). When compared with their written sentences, more of their spoken sentences were judged by a panel to be syntactically and semantically deviant. Abercrombie (1) pointed out that such descriptions of unrehearsed speech do not imply that it is a substandard form of language. He argued that such apparent deficiencies only become noticeable when the speech is transcribed for analysis. In a conversational setting, part of the meaning resides in the shared context of the dialogue and part is communicated by the extralinguistic signals of gesture, facial expression, and intonation. In writing, on the other hand, all the meaning has to be carried linguistically. Thus, writing is obliged to have a more consistent internal structure and adhere more closely to grammatical and semantic conventions.

These structural differences between spontaneous speech and formal writing exist within general channel differences which distinguish listening from reading. In listening, the cue system is temporal and ephemeral and, as such, not amenable to recapitulation; whereas, in reading, the graphic cues are static and spatial permitting regression if sampling or reconstructive incongruities occur. The reader can control his rate of processing while the listener generally must follow at the rate of the speaker.

From these linguistic and channel differences between the two forms of language processing, it could be hypothesized that the listener to spontaneous speech is less tightly constrained than the reader in his cue sampling and meaning reconstructions. The linguistic cues of spontaneous speech, being less coherent and less congruous than those of edited, polished writing, could permit greater latitude of interpretation to the listener. The reader, on the other hand, could be processing a less flexible set of cues which would be more likely to reveal to him sampling or reconstruction deviations.

Thus, the research question which this study sought to address was whether the meaning reconstructions of relatively mature readers display less variability and greater fidelity to the original than those of

listeners to spontaneous speech. The study was designed to generate data related to this question.

Data Collection

Three independent samples of forty-eight grade eleven students were randomly divided into two treatment groups each. One treatment was a listening task involving a short videotaped discussion between two grade eleven students from a different school. The other treatment was a reading task using a written version of the same discussion prepared from the original by this writer. There were three such paired versions, a different pair for each sample.

The listening groups watched a videotape and the reading groups read a written version. Then, under identical conditions, both treatment groups wrote down all they could recall of the content of the discussion. These written recalls represented the source of the data of the study. They were analyzed according to post hoc categories related to the fidelity of the recalled ideas to the content of the original discussion texts.

Analysis Categories

The first step in this analysis was to identify the idea units in the original stimulus texts. For each pair of discussions (consisting of an oral and a written version), a list was compiled of the original ideas defined as explicit assertions by the speaker. For example, the fourth original idea from the discussion dealing with Taiwan's expulsion from the United Nations was the assertion: "China has a population of about 750 million people." Each list of original ideas applied equally well to its oral and written versions since the latter had been prepared from the content of the oral version.

The second step in the analysis was to compare each written recall text with the list of original ideas and credit the recall with each identifiable original idea it contained. Each subject then had a score for recalled ideas. These recalled ideas were analyzed qualitatively in terms of fidelity to the original idea. The recalled ideas which were recognizable yet changed in meaning were called distortions and subtracted from the score for recalled ideas, leaving a score for nondistorted recalled ideas.

A second qualitative analysis examined the way each recalled idea reflected its role and location in the original discussion text. Those recalled ideas which displayed an appropriate role and location through association with other relevant original ideas were marked and each subject was given a score on this qualitative measure, called recalled ideas displaying an appropriate relationship.

After this analysis was completed almost all the recall texts contained material that was uncategorized because it was not identifiable as being derived from explicitly-stated original ideas. In his famous study of memory, Bartlett (2) called this phenomenon *importation*. It occurs in recall tasks when the subject remembers ideas that were not explicitly stated in the original but which were unstated assumptions and conclusions—inferences made by the listener or reader or quite extraneous information contributed by his prejudices, beliefs, or mistaken meaning reconstructions.

Each subject was given an importation score based on the percentage of response units (the smallest number of words in a recall text that constituted a complete thought) that were not directly derived from explicitly-stated original ideas.

As a result of this classification, each subject in each sample had four criterion scores: 1) number of recalled ideas, 2) number of recalled ideas displaying an appropriate relationship, 3) number of nondistorted recalled ideas, and 4) percentage of imported response units.

Statistical Analysis and Findings

These scores were analyzed by two-way analyses of variance, treatment x reading levels. Each dependent variable was tested separately and each of the samples was treated independently. Table 1 shows the treatment group means from these analyses and the F ratios from the statistical tests of their differences.

Table 1 shows that the groups which read the written versions produced mean scores for all three types of recalled ideas that were consistently higher than those produced by the listening groups. In at least two out of the three samples, the F ratios were significant at either the .05 level of confidence or above. The table also shows that, in two out of the three samples, the listening group's recall texts contained a significantly greater proportion of imported response units than those of the readers. These statistical analyses showed that the recall texts of the readers relative to those of the listeners were characterized by: 1) more recalled ideas, 2) more recalled ideas displaying an appropriate relationship, 3) more nondistorted recalled ideas, and 4) a lower proportion of response units that were importations.

Conclusions and Discussion

These statistically revealed differences were between the written recalls of groups of readers and listeners and as such did not directly answer the question of differences between reading and listening. The

relationships between these data and the research question were indirect and dependent upon logical inference.

Table 1. Listening and Reading Means and F Ratios from the Two-Way Analyses of Variance, Treatment $\times$ Reading Levels

Variable	Treatment Means			F. Ratio
	Sample	Listening	Reading	
Number of Recalled Ideas	A	7.7	10.2	4.89*
	B	4.6	6.0	3.06
	C	6.2	8.6	9.25**
Number of Non-distorted Recalled Ideas	A	5.9	8.5	7.99**
	B	3.3	5.0	6.70*
	C	3.4	4.8	4.35*
Number of Recalled Ideas Displaying an Appropriate Relationship	A	5.9	8.0	3.07
	B	3.3	5.1	5.34*
	C	3.5	6.2	10.24**
Percentage of Response Units that Were Importations	A	49.2	37.1	4.89*
	B	42.9	31.3	5.49*
	C	48.0	51.8	.64

* $p < .05$ ** $P < .01$

The only difference between the tasks facing the two groups of subjects was that one read a passage of formal writing and the other listened to a spontaneous spoken presentation. The meaning content of each was the same. The groups of subjects were randomly equivalent and the written recall task itself was identical for both. The differences in the written recalls, therefore, must have been attributable to the manipulated variable. The processing, by cue sampling and message reconstruction, must have been affected by the differences between the two presentations.

The findings seemed to indicate that the written recalls of the listeners were less congruent than the readers' with the ideas of the original discussion texts, congruence being indicated by recognizable recalled ideas, recalled ideas displaying appropriate relationships, nondistorted recalled ideas, and the absence of imported material.

It had been hypothesized that, given the linguistic differences between spontaneous speech and formal writing and the channel differences between the processing of each, reading was a more rigorously con-

strained form of language processing than listening. Reading demanded greater precision of cue sampling and required less variable meaning reconstructions. It was concluded, cautiously, that the data from this study supported such an hypothesis.

As groups, the readers remembered more original ideas than the listeners. There would seem to be no reason why listeners should be more prone than are readers to forgetting processed information. Therefore, it seems logical to claim that the readers must have been more successful than the listeners in processing the original explicitly-stated ideas. However, the written recalls of the listening groups were just as long as those of the reading groups so that their meaning reconstructions must have failed more frequently to match explicitly-stated original ideas. The listeners' meaning reconstructions, expressed as material in their written recall texts, must have been characterized by greater divergence and variability from the original explicitly-stated ideas. One could speculate that this was caused by the less coherent linguistic cue system of spontaneous speech; by the absence of opportunity to reexamine ambiguous ideas resulting from incongruous reconstructions; or by a relatively greater propensity for one's existing structure of knowledge and beliefs to intrude upon the processing, with the result that the listener had greater latitude to hear what he thought he heard or what he wanted to hear. The reader, on the other hand, was obliged to respond more precisely to the intended meanings of the writer.

These possible causal inferences about the reasons for the differences in the recall texts are speculative. The data and design of this study permit one to say only that differences seem to exist between the varieties of listening and reading involved in the comparison. Furthermore, these differences appear to relate to precision of language processing. One unique characteristic of reading seems to be that, as one form of language processing, it demands or permits relatively greater fidelity to the content of the message than does listening to spontaneous speech. Whether this is attributable to linguistic or channel variables or to a combination of both is a question requiring further research.

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Cognitive Development

This paper raises pertinent questions regarding the natural development of children's cognitive skills and their relation to reading skill development in early years. Read the questions in the conclusion before you read this article.

Schematic Learning and Reading

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There are peculiar facets concerned with learning to read. Some children apparently have extreme difficulty in learning to read; yet others learn quite easily. There is evidence (3, 6, 20) of preschool children who read fluently. Somehow they have gained access to written language, often through tv commercials, signs, or names on packages, and the more fortunate ones, from having stories read to them. These precocious readers come from a wide range of social backgrounds and intellectual abilities. They are not considered privileged, either socially or intellectually.

Torry (20) reported a case study on John, a five-year-old black boy, who was able to read at the level of a ten-year-old. She found him to have many similarities with the readers in Durkin's study (6):

- he was not from a privileged background
- he took the initiative in learning to read and write rather than being taught
- he took great interest in identifying any words and numbers he saw
- he enjoyed writing and spent time printing words and numbers
- his earliest reading material was tv commercials, labels, and the like

Torry describes his reading as fast and confident. John liked to read the instructions for a game or task. He did not sound out words but preferred to ask about those he did not know. John treated written language as a natural alternate version of spoken language and he expected print to mean something. Any phonic knowledge or word

attack skills were strictly subordinate to John's task of reading for meaning.

John's family were emphatic that there had been no conscious teaching; they had been surprised to find that he could read. They referred to his interest in the TV commercials and said that he could recite them all and that he liked to write. They reported they had responded to his questions.

Acquiring Reading Naturally

It would seem that children (John is by no means unique) can acquire reading in much the same way as children acquire language. There is no doubt that, before formal schooling, children acquire a language system complete with its own rule-governed grammar. Apparently, they manage this feat from the language around them and the feedback provided in purposeful discourse. With very little explanation or teaching of rules, children can generate a variety of novel and well-formed sentences, as Mollitt (14) describes, "according to a paradigm or model they have unconsciously inferred for themselves." He continues

The learner's abstractive apparatus reduces a corpus of information, such as other people's sentences, to a usable rule. It is a data processing gift that enables us to learn something but not how to do something.

The necessary feedback has come about in the everyday social interaction between speaker and listener, each one of them concerned with communication, comprehension, and meaning. Responses are real and pertinent to the communication; information is immediate to the situation at the optimal moment. In this immediate, personal situation, the child is best able to assimilate a wider range of samples into his developing schemes. Neither in the acquisition of language, nor in precocious reading has there been any direct instruction or any attempt made to restrict the child's access to any available language, or to feed it to him in some adult-ordained sequence. In fact, Durkin (6) reported on some parents who wanted to teach their preschool children to read but found no response.

Young children acquire language in a very personal way from their interaction with the environment. Most of them have access to some form of written language, certainly to the limited form from which John learned to read. It is intriguing that some children pay special attention to language in this way and, as Torry says, seem to ask the right questions about the relationships between language and print. Children must be highly motivated to pursue this particular interest, and children of preschool age are highly motivated. A four-year-old daughter of a

friend was determined to learn to ride a two-wheel bicycle and she worked at it four hours a day for three months in order to achieve her objective. Most parents can give similar examples of a young child's persistence.

High Motivation for Learning Characterizes Four-, Five-, and Six-Year-Olds

Four-, five-, and six-year-old children are highly motivated to learn. Furth (7, 8) emphasizes this when he discusses the "spontaneously growing intelligence" which characterizes the preoperational stage of development. This is a period when concepts of time, space, relations, and classes are developing and when children are building the bases on which the learning of any special knowledge must form. In order to maintain and develop intellectual curiosity in the early years in school, children are better served if they are engaged in activities that they see to be important to their own learning, that are challenging, and that demand some degree of high level operative thought. Furth deplors that, at this important stage of their lives, children entering our schools are faced with the tasks of learning to read and write—with these skills being taught as if they were ends in themselves. The inordinate amount of time spent not only contributes little to intellectual growth but, in many cases, actually interferes with it. Furth maintains that, instead of continually searching for new methods of teaching reading, educators should be questioning whether reading instruction *per se* should be the main focus of early education. There is evidence that many children read well by the time they are seven years old in schools where developing intellectual curiosity is fundamental and where their proven capacity as highly motivated learners is understood and fostered.

Active, Purposeful Learning for School Beginners

For all children, education should offer challenge and the excitement of learning, the opportunity to ask questions and to seek solutions. It is imperative that early education challenge intellects and inspire active learning in children from homes that are not intellectually stimulating, in children who are accustomed to the deadening passivity of television, and in children whose experience of life is distressingly limited. Schools carry too many apathetic, disinterested youngsters whose goals are simply to find out what is expected of them so that they can produce what they think is wanted. This is well summed up by the nine-year-old, who after five years in school described education as "learning a lot of things so when they ask you, you know it." This child's attitude toward

reading showed the same lack of understanding. He saw the purpose of reading as "knowing some words so that you can read them."

Early Reading Instruction

So much of early reading instruction in schools is low level, descriptive, rote learning concerned with what Piaget calls the *figurative* aspects of knowing (7). How else can you describe the sort of situation where *m* is isolated as "the letter of the week," dittos are run off with pictures of mice and monkeys to be colored, and cookies are cut in the shape of the letter *m*. What about the interminable hours spent on Bingo—Bingo with letters of the alphabet, Bingo designed to practice hearing initial consonant sounds, and so on. This is not how John and other early readers began. This is the kind of adult-ordained sequential instruction put out by people who think learning is *outside* the learner, rather than inerridirected. It comes from the kind of reading research that Goodacre (10) refers to as concentrating on "how adults believe children learn to read," methods that reflect adult ways of learning rather than children's own learning patterns.

Inadequacies of Reading Research

Much reading research has centered on single aspects, for example, studies in perception, eye movement, letter-name knowledge, or comparison of specific methods. Scientists have long been aware that when a component of a whole is isolated for focused observation it is changed and, to some degree, takes on new characteristics. Yet, much of our knowledge in reading comes from this kind of investigation. Reid (16) draws attention to the fact that there have been relatively few attempts to produce a coherent and unified account of what goes on when a child is learning to become literate. The child must bring about his own learning as he organizes new information in the light of his previous knowledge and understandings, his knowing schemes (12).

Building Reading Schemes

The Piagetian viewpoint is that each person constructs his own mind, his own learning, and that this learning has its origins in the reflexes present at birth. The sucking reflex, for example, is applied to any object that touches the baby's mouth. It becomes a scheme, as the baby begins to differentiate and assimilate variations in sucking. At a later stage, the child may have a scheme for dog that relates only to the family pet and

the dog next door. He assimilates any examples he sees of "dogginess" to his dog scheme, not always correctly. For example, a small child seeing a cow for the first time, may well describe it as a "big dog" because the features he notices fit his scheme of dog. When he realizes that this animal does not fit his present scheme, he makes an accommodation and a new scheme is formed. Every scheme is the result of an assimilative activity. Its function is to incorporate the new into what is already familiar and to make generalizations. As Furth (7) puts it, "Schemes are the structural results of the functioning of assimilation."

Figurative and Operative Knowing

Piaget distinguishes between *figural* and *operative* aspects of knowing. The child who can discriminate that *cow* is different from *dog* makes an accommodation; but while his knowledge of cow is limited to perceptions of particular cows (for example, the cow he sees in the next field or the black cow), it is not a true scheme because it has no generalizing, assimilative function. It remains figural, that is, confined to the here and now. When the child abstracts some of the attributes of "cowness," his knowing is no longer confined to the figural aspects of particular cows, and becomes a scheme—part of a system of classes. "A scheme is inherently linked to other schemes in hierarchical divisions and subdivisions of generality" (7).

All "knowing" has two related aspects: figurative and operative. A three-year-old and a ten-year-old will "know" an airplane flying overhead in very different ways. The younger child will see a plane and recognize it from its contours, the noise it makes, and the fact that it is in the sky. The older child will see a DC-10 coming from the East preparing to land at the city airport. His scheme of knowing is more elaborate; it includes more operative knowing.

Four-year-old John can recognize that *J* is what his name begins with. He knows *j* in a totally different way from someone who knows *J* in a class known as "letters." John can know the sound *J* makes at the beginning of *John* and know this as another name for *J*. This is a different kind of knowing from understanding sound-symbol relationships. The figural aspect of *J* is static. The operative aspect is the transforming action-character of intelligent thinking. The level of knowing is directly related to the operative structures. John's knowledge and understanding of *J* will change, not because the figural aspects of *J* will change but because his operative structures will have changed. This operative knowing is brought about through the transforming action of the individual; as he does his own learning, he builds up and uses his own schemes.

Instruction May Interfere with Schematic Learning

Schematic learning is the main stream (13) of learning. It is the means by which children have acquired all their learning and by which preschool children have learned to read. Almy (1) sees the challenge to education as the demand for "teachers who are well informed and thoughtful and who understand as much about the ways children think as they do about the subjects they teach." Difficulties arise for children in school when we cut across their natural way of learning. Cazden (2) points out that, "adults may interfere with a child's learning if they press for behavior that looks or sounds 'correct' regardless of its relation to the child's internal mental organization." How much of this occurs in early reading when the emphasis is on teaching reading, with little knowledge of or regard for children's thinking?

The concept of reading readiness developed because the mismatch between early reading instruction and the thinking structures of young children was recognized by people such as Morphet and Washburn (15), Gates (9), and Schonell (18). Gates found it meaningless to make statements about an optimal age for beginning reading without knowing the circumstances of learning. The whole notion of reading readiness is irrelevant if we see all learning as cumulative and if we accept the child as a scheme-builder, constructing his own intelligence through his interaction with the environment. Learning to read and write is encompassed in this whole notion of learning and is enriched and made more comprehensive because its dimensions are so much greater.

Motivation is intrinsic in schematic learning since the dynamic aspect of affect is inherent along with the structuring aspect. Why else do we find the learner actively seeking new assimilations? For example, five-year-old Mary was intrigued by names. She made a "name book" in which she wrote all the names she could gather, shifting from names of persons and animals to names of things.

Robbie, just six, wrote the name of his favorite food, *pazza*. He looked at it again and realized he had made a mistake. "Wait a minute," he said, "just scratch that *a* and put *i*. I meant to write *pizza*." Then he wrote, "I like chicken too."

"How did you know how to write *like*?"

"Well," replied Robbie, "I keep reading it in lots of books and I keep thinking it's *leek*. Then I try it again and I go *l-l-ike*."

Next is an example of a child clearly assimilating a new piece of learning. Mary, a first grader, came to her teacher with a homemade dictionary, open at the page headed *s*, and asked her to write *some*. Mary looked at the entry in her book and said scornfully, "I asked you for *some* not *so me*. That's not what I want." Her teacher said, "Look, I'm going to write *so* and *me*," which she did. Mary studied the two entries and then said, "Oh, *so me* is *some* when you don't leave a space."

In contrast, Robert, who is seven and one-half, and has been taught reading skills in school, explains how he was able to read *one*. "I sound it in my head. I know it's three words. I say that word (pointing to the *o* in *o-n-e*), and that word and that word and then I say *one*."

Valerie, age eight and very slow to begin reading, was helped by her teacher to compose what she wanted to write about a picture of a volcano she had painted.

"I done a volcano and I had to mix a lot of colors," she wrote. This was her own language about her own interests; yet, she appeared to have no means of reading it other than word by word. Each time she came to *mix* there was a stop. "What did you mix?" asked her teacher, helping her to anticipate the rest of the sentence. "Colors" replied the child and then proceeded to reread the sentence, reading word for word. It seemed that she did not realize that anticipation had any part in reading. Whatever schemes she brought to reading did not seem to include the basic idea that there was a message or meaning of any kind.

Children in this state of confusion have little to build on to help them with their problem. Clay (4) comments that "not watching individuals learn will result in the survival of the fittest. Those who can, will learn; those who cannot will become confused or develop false concepts and handicapping strategies."

In the research of Reid (16) and Downing (5), there was evidence that most youngsters approaching reading have little idea what it is all about. The researchers found that, through having access to books and stories and through reading labels and captions, many of the children's confusions began to be ironed out during the first year at school. There is no reason for withholding books from even the most immature child.

Southgate (19) makes this important point:

In all reading tuition the first aim should be to produce children and adults who want to read and who do read; the second aim should be to help them read effectively. If the second aim is given priority, it is probable that the first aim will never be achieved. In other words, neither recreational nor functional reading can be expected to be the end product of extended intensive instruction in reading skills. Reading must consist of recreational and functional activities from the very beginning.

If we believe this to be true, the learning environment should reflect it. Children need to have access to a wide array of attractively arranged, inviting books of all kinds: stories, poetry, and information books. Children should be invited to enter the world of books by being read to frequently. They should learn to consult books—to look up recipes, to

know how to keep earthworms, to see what kinds of dinosaurs there were. Children need access to books which have been read to them so that they can "read" and enjoy them again and again, individually and with friends. Thus, from their very first contact with books, children will get the idea of *response* to literature and understand that there is a message in reading; it's about something.

Simultaneously, the rich learning situation should be such that labeling and writing are needed and children begin to get some understanding of the meanings and functions of visual symbols. "Will you put a notice telling people not to touch?" asked one five-year-old. Another child watched a teacher writing a story for a friend and quickly made a picture because she, too, wanted "some of those things." Notices should be placed in the classroom providing information about how many children are at school that day, whose birthday it is, the menu for lunch. Children make their own books and compose their own language. This provides reading material in a context completely personal and known to them.

Clay (4) isolates three sets of reading behavior in the early stages of literacy: 1) visual attention to print, 2) directional rules about movement and position, and 3) talking like a book. All these behaviors are being attended to with conscious and positive help from the teacher. She watches for signs that eye-voice-finger coordination is developing. She is careful that the child "reads" from left to right. As she writes for him she says simply, "We always begin on this side." If she's writing a caption she may ask, "Where shall I begin?" When she reads the caption she may ask the child, "How many words are there? Can you read them? This begins with T." In these early stages when attitudes toward reading are building, the teacher ensures that language pertaining to literacy concepts are used (for example, *word* and *letter*), that correct strategies are beginning, that children are responding to meaning in what they read, and that they note various forms of written language. "Down the road went the little red hen," is an example of the literary form of language.

The teacher uses her knowledge of language and the skills involved in the ability to read, not to sequence instruction but as a framework that enables her to recognize the significance of the children's own actions and comments. Her knowledge of the structures involved in acquiring the concepts of literacy, coupled with a real knowledge of how children learn, enable her to help each child build sound strategies and understanding of reading from a personal, relevant approach. This allows the child to read natural language with significant meaning, not language simplified according to adult logic, or linguistics, or a notion of primer English. This, in itself, allows the learner to bring his oral language experience and his own learning schemes to the written form of language and help him predict what is likely to happen.

Concluding Questions

- Are we wise to spend so much time, in the early school years, teaching reading as a "head-on" activity?
- Is there a risk that we actually interfere with the intellectual development of children when we pay no attention to their own way of learning, when we ignore their own developing network of schemes?
- Is it possible that we actually create many of the reading problems that occur later?
- Could reading be more significant in upper school grades for the many children who can but don't read if, from the very beginning, reading is seen as functional, pleasurable, and relevant to the child himself?
- Do we teachers really need to teach the youngsters everything we know (or that the guidebook dictates), or is teaching more effective if we know how to supply relevant information at the optimal time?

Sir Alec Clegg spoke of teachers who saw their jobs as "packing the trunks" and contrasted them with those who believed their jobs were intended "to light the fires." What a distressing thing it would be if, in our overzealousness to pack the trunks, we actually extinguish the sparks waiting to be fanned.

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Word Attack Skills

This paper identifies seven understandings about language which are most likely to be important to a reader of English.

What Every Student Should Know About English Word Formation

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A review of the research on the teaching of vocabulary reveals little communication between researchers and teachers when it comes to the teaching of vocabulary skills (8). Research is incomplete on the importance of knowledge of English word structure for English reading vocabulary. There has been enough research reported, however, to make it difficult to represent it fairly in this short article. In addition, linguists and reading experts have a great deal to say on this topic. To the extent it is possible, some of the most relevant of this literature is referenced to support the seven generalizations made here and to provide a source of additional information for readers who are interested in expanding their knowledge in this area.

Roots in Words

The writer (9) found a strong relation between knowledge of derivatives and knowledge of word parts when derivatives contain a root word (the *rational* in *irrational*), but not when derivatives contain only a word root (the *-tain* in *contain*). It was concluded from the study that speakers of English make excellent use of the meanings of prefixes and root words to determine the meanings of English derivatives, but they do not make similar use of the meanings of word roots. For example, speakers of English use the meaning of *rational* to determine the meaning of *irrational*, but they do not use the meaning of *-tain* to determine the meaning of *contain*. Thorndike (10) drew an analagous conclusion with regard to derivatives which possess a suffix.

There are many vocabulary experts who believe students should know the meanings of Latin and Greek roots and use the meanings, with the

meanings of prefixes and suffixes, to determine the meanings of English words (5, 8). In fact, reading experts who address themselves to word structure consistently suggest the possible value of giving students instruction in Latin or Greek roots.

This is surprising in that research does not support the thesis that knowledge of the meanings of Latin or Greek roots is related to knowledge of the meanings of English words (1, 4, 7, 8, 9, 10). In addition, it is extremely difficult to elicit such a generalization from the linguistic literature (2, 3, 6).

When teachers see a logical relation between the meanings of Latin or Greek roots and English vocabulary, they should communicate this information to their students. For those teachers who have been uncertain as to the existence of these relations, the following generalization may be drawn from research.

1. *Students should know to use the meanings of English root words to determine the meanings of derivatives, but they need not know to use the meanings of Latin or Greek roots for this purpose.*

Prefixes

One of the best sources of information about present day English word formation is a scholarly work by Marchand (6). Comparing Marchand's notes on prefixes to words listed in unabridged dictionaries, it may be determined that the following prefixes have one frequent meaning when prefixed to English root words: *anti-*, *co-*, *dis-*, *ex-*, *hyper-*, *il-*, *im-*, *ir-*, *mid-*, *mis-*, *multi-*, *non-*, *post-*, *pre-*, *pro-*, *re-*, *semi-*, *sub-*, and *super-*.

The prefixes *in-* and *un-* are not included in the list because, though their one frequent meaning is *not*, they also have second meanings which occur with regularity. The prefix *in-* means *in* in such derivatives as *indoors*, and the prefix *un-* means *do the opposite action* in such derivatives as *unlock*. On the other hand, it is probably best to avoid confusing young students with the alternate meanings of some prefixes. For example, many teaching materials emphasize that the prefix *re-* may mean either *again* or *back*. While only four derivatives come to mind in which *re-* means *back* (*rebound*, *recall*, *recoil*, and *repay*) there are hundreds in which *re-* means *again*.

Finally, student knowledge of the meanings of the common prefixes should not be overestimated. It was discovered that a large proportion of college freshmen did not know the meanings of such common prefixes as *post-* in *postwar*, *im-* in *impossible*, and *mis-* in *misdirect* (9).

The generalization with regard to prefixes is the following.

2. *Students should know the common meanings of prefixes which prefix to English root words to form derivatives, but not those which prefix to Latin or*

Greek roots. That is, students should know the meaning of the *co-* in *coworker*, but they need not know the meaning of the *con-* in *contain*.

Suffixes

Thorndike (10) showed that suffixes have many more meanings than they are often believed to have. The suffix *-ful*, for example, was found by Thorndike to have a total of thirty-eight different meanings. While it ranks very high in stability of meaning for suffixes, its most frequent meaning, *full of*, is present in only about one-third of derivatives containing the prefix *-ful*.

Of the ninety suffixes for which Thorndike tabulated frequencies, there are only five which occur with great frequency and which possess a recognizable meaning in a large percentage of their occurrences. They are *-able* (meaning that can be Xed, as in *allowable*), *-er* (meaning a person or thing that Xs, as in *singer* and *stopper*), *-ful* (meaning having X, as in *beautiful*), *-ish* (meaning like X, as in *selfish*), and *-less* (meaning without X, as in *beardless*).

Most other suffixes occur infrequently or do not have a frequent meaning in their occurrences. In general, suffixes function primarily to change a word's part of speech. For example, the suffix *-ify* changes the adjective *pure* to the verb *purify* and the suffix *-ment* changes the verb *attach* to the noun *attachment*. Therefore, in the case of suffixes, it is important that students know to identify root words in derivatives and to use the context of what they read to help them determine the meanings of derivatives formed from English root words and suffixes. That is, students should know the meaning of *-er* as in *singer*, and they should know to use the meaning of *induce* and context to determine to meaning of *inducement*.

The generalization with regard to suffixes is the following.

3. *The students should know the common meanings of suffixes and they should know that root words in root-suffix derivatives may be used with context to identify such derivatives.*

Inflected Forms

There is a class of suffixes called *inflectional suffixes* or *inflectional endings*. These suffixes occur so often that in tabulating the frequency with which words occur in English, Thorndike (11) counted only root words and not inflected forms (he would count *walk* when *walked* or *walks* appeared). The inflectional endings include the noun possessive, noun plural, present third-person singular, present participle, past tense, comparative, superlative, and adverbial. Students should understand

there is an inflectional ending spelled *-er* which is used on adjectives to make comparisons.

Considering the great frequency with which inflectional suffixes occur in English, the following generalization may be drawn.

4. *Students should know the inflectional endings and how they function in English.*

Limitations of Word Structure

There are two important limitations in using English word structure for word identification. First, there is not always a one-to-one relation between the meaning of a derivative and the meanings of its parts. For example, *re-* most frequently means *again* when it is prefixed to English root words. However, the meaning of this prefix and the meaning of the English root word are lost in the derivative *recapitulate*. A synonym for *capitulate* is *surrender*, but *recapitulate* (which is derived from *re-* and *capitulate*) does not mean *surrender again*. Rather, *recapitulate* has the synonyms *summarize* and *repeat*.

The second major limitation of using English word structure is that many words begin with the spelling of a prefix, or end with the spelling of a suffix, but do not contain a prefix or suffix. For example, the word *under* does not contain the prefix *un-*, and the word *punish* does not contain the suffix *-ish*. Also, *punish* does not contain the English root word *pun*. The *pun* in *punish* comes from a quite different etymological source than the *pun* which refers to humor.

There is no information as to how frequently knowledge of either of these limitations needs to be applied; however, the following generalization appears to be strongly indicated.

5. *Students should know the two major limitations of analyzing words into their parts: a) that there are times when the combined meanings of word parts is not the meaning of derivatives and b) that the presence of a prefix, suffix, or root word in a derivative is not determined by spelling alone.*

Spelling Changes in Roots

When suffixes are added to English root words, the root word frequently undergoes a change in spelling. It is knowledge of the conditions under which silent *e* is dropped and final consonants are doubled that helps students to identify the root words in such pairs of words as *hoping/hopping*, *scraped/scrapped*, *scared/scarred*, and *striped/stripped*. Similarly, students may have difficulty identifying roots such as the *apply* and *remedy* in *applied* and *remedial* if they do not understand that

the condition under which final *y* is changed to *i* is as important to reading as it is to spelling. This leads to the following generalization.

6. *Students should know how to identify English root words in derivatives when the spelling of root words has been changed because a final e was dropped, a final consonant was doubled, or a final y was changed to i.*

Pronunciation and Affixes

The relation between affixes used in English and pronunciation is important even at the earliest stages of learning to read. Noun plurals and the present third-person singular are formed by *-es* when root words end in a hissing sound (sibilant sound). It is easier, for example, to pronounce the plural of the noun *glass* (*glasses*) when the plural is represented as a separate syllable. Similarly, it is easier to pronounce the present third-person singular of the verb *splash* (*splashes*) when present third-person singular is represented as a separate syllable. It is for this simple reason that words ending in sibilants (*-ss*, *-sh*, *-ch*, and *-x*) add an extra syllable to roots in forming the noun plural and present third-person singular.

At a more advanced level, it would add to understanding of language if students knew that *im-*, *il-*, and *ir-* are variant spellings of the prefix *in-*, meaning *not*. They could be shown that these spelling changes of *in-* have come about because it is easier to pronounce derivatives with this prefix when it is spelled in different ways depending upon the initial consonant of the root word to which it is prefixed.

This leads to the final generalization.

7. *Students should understand the role pronunciation has played in determining the spelling of inflectional endings and other affixes.*

Summary

This paper has provided a brief description of what educational and linguistic research suggests students should know about English and word formation. It has not summarized everything worth knowing about English word formation, but it has identified the seven understandings which are most likely to be important to readers of English. It has been the experience of the writer that students up through the college level will benefit from instruction in these understandings. It is believed teachers of reading at all levels will find satisfaction in the teaching of English word structure when they develop the understandings which have been identified here. Teachers will find that when they compare the criteria listed here to instructional materials in their classrooms, it was not these seven criteria which guided the construction of materials

for the teaching of English word structure. Then, if these understandings are important, the teacher must consciously teach them.

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This paper suggests that vowel generalizations and vowel drills have little effectiveness and little validity. Children learn to read by reading, not by completing worksheets.

The Truth About Vowels

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Young children learn to read through the development and application of certain skills as well as through practice in reading. Pertinent to this paper is the implication that the limited time available for reading instruction must not be squandered with drill on nonessential skills at the expense of experience in reading.

In the view of this writer, activities dealing with vowel generalizations clearly fall into the category of nonessentials. Many times when children do not perform well on drill sheets relating to vowel generalizations, they are given additional work on these generalizations instead of moving on to more important activities. Evidence follows to suggest that the teaching of vowel generalizations is ineffective, both from analyses of the nature of English orthography and from studies of the effectiveness of emphasizing vowel generalizations to primary children.

The Nature of English Orthography

In the past ten years, considerable research has been published relating to the utility of phonic generalizations. Undoubtedly the best known is that of Clymer (6), who examined four basal reading programs at the primary level. He drew out forty-five generalizations that were to be taught in the four programs and then checked the utility of these generalizations against the vocabularies of the same four programs. Of twenty-four vowel generalizations, only six reached Clymer's criterion of 75 percent utility. Of the six, two are so vague as to be of doubtful help in reading.

Bailey (1), Burroughs (4), and Emans (8) applied the Clymer generalizations to vocabularies beyond the primary level and found essentially the same lack of utility. Rather than settle the issue, such findings have led educators to two quite different conclusions: 1) some (including this writer) recognize that vowel generalizations are faulty and suggest that

time can be better spent on other, more effective reading activities; and 2) some recognize that the vowel generalizations are faulty, but seek to find more accurate generalizations.

Taking the latter direction, Fry (11), Emans (9), and Burmeister (3) have suggested a proliferation of rules to replace the general digraph rule ("When two vowels go walking. . ."), which Clymer found to be true 45 percent of the time. Dealing with each digraph separately does insure greater "truth value" for some, but it also reduces the applicability in terms of numbers of words. For example, one might teach children rules for *ee-e*, *ei-e*, and *eo*, all three of which would be true 100 percent of the time. Unfortunately, each rule would apply to one word in Fitzgerald's list (10) of 2,650 words.

Children will eventually leave basal reader vocabularies. Are there elements in the real world of English that lend credibility to some vowel generalizations? In an effort to answer this question, Hillerich (17) charted the vowel letter-sound (reading) and sound-letter (spelling) relationships as found in three studies: Hillerich's analysis (14) of Fitzgerald's 2,650 words (10); Hanna's Stanford study of 17,000 words (13); and Dewey's study of over 10,000 words (7).

Both the Dewey and Hanna analyses were from a spelling viewpoint and are, therefore, not directly pertinent to reading. However, by developing two-way charts from these studies, this author has made them applicable both to spelling and to reading.

The Hanna study has been interpreted in various ways. For example, one finding was that the computer—programed for 203 rules—was able to spell the 17,000 words with 83.82 percent accuracy. This finding has led some to the conclusion that English sound-letter relationships are about 84 percent "regular." Often overlooked, however, is the fact that this finding was based on feeding the 17,000 words into the computer phoneme by phoneme. When whole words were examined, the computer was only 49 percent accurate; i.e., in terms of whole words rather than phonemes, English was found to be 49 percent "regular" in its sound-letter relationships.

This great difference between the consistency of sound representations in phonemes as opposed to whole words was also borne out by Groff (12) when he analyzed 1,101 words from the New Iowa Spelling Scale. Despite the fact that he considered as phonetic both *cs* (*cut, cent*), both *gs* (*give, gem*), and both *oos* (*foot, too*) Groff found 75 percent of the words nonphonetic; on the other hand, he reported only 18.8 percent of the letters nonphonetic.

Such discrepancies between the regularity of phonemes or graphemes and whole words should not be too surprising. Words in English have about two consonant phonemes for every vowel phoneme. The consonants tend toward more of a one-to-one correspondence, especially from

the reading viewpoint where double consonants are not a problem. In practice, one must consider the whole word rather than individual phonemes in speaking of regular correspondences: no one credits the reader or speller as being 75 percent correct in reading or spelling a word.

It is not our purpose here to criticize the Hanna study, since that has been done elsewhere (5, 20). Any attempt to analyze the Hanna findings must first reorganize his classifications. Hanna used a twenty-two-vowel system as opposed to the usual dictionary classification of about fifteen vowel sounds. As a result, there are eight different classes of graphemes (really preorganized for spelling) for the *schwa*. Vowel sounds in *off*, *all*, *arm*, and *pot* are in four different classes, whereas they normally would be in two (/o/ and /ā/). Second, Hanna used the very formal "spelling pronunciation" of words, a pronunciation style used only in that "other world" of English.

Space and copyright do not permit reproduction of charts of the three studies here, but some highlights follow. In general, the studies are in agreement, once the Hanna data are reorganized into a standard fifteen-vowel classification. Most remaining variations among the three studies can be accounted for in terms of vocabulary size (2,000, 10,000, and 17,000 words) and dialect variation. Table 1 summarizes, from a reading viewpoint, some of the data from the three studies.

Table 1. Summary of Three Studies Based on a Fifteen-Vowel-Sound Classification

	Dewey	Hanna	Hillerich
Number of Words	10,119	17,000	2,650
Number of Different Graphemes	87	69	57
Average Number of Sounds/Grapheme	2.3	2.8	2.5
Number of Graphemes with One Sound Value	46	23	24
Average Number of Words Accounted for by "Consistent" Graphemes	6	11	3

Table 1 indicates that the average number of sounds represented by each grapheme is about 2.5. The average is a misleading figure, however. One must note that, while about half of the graphemes have one sound value, these graphemes account for very few occurrences in words. Removal of these high utility but seldom-used graphemes greatly

increases the number of sounds represented by the remaining 50 percent of the graphemes. For example, even the single vowels *a, e, i, o, u* represent 7, 6, 4, 7, 6 different sounds, respectively.

Many basal reading programs teach that single vowels between consonants have their short sound. Clymer (6) found this true 57 percent of the time and Hillerich (14), 56.5 percent. More specifically, linguistic programs begin by trying (inductively) to teach that *a* = /a/ (A fat cat sat on a mat). This specific generalization is true only 40 to 54 percent of the time. (Perhaps developers of the linguistic programs were looking at the other side of the coin: for spelling, /a/ = *a* 96 to 98 percent of the time.)

To make matters worse, 25 percent of all vowel sounds represented on a page are the *schwa* sound. Any one of twenty-six different graphemes (one-third of all the graphemes reported) may be used to represent that sound. What can be taught about such a high frequency sound represented by such a variety of graphemes?

As if the observed lack of consistency were not enough, adult analysts cannot even agree on classifications. Hanna fails to recognize existence of the vowel grapheme *io* (*action*), whereas Johnson's printout (18) from Venezky's study indicated this as the most frequently occurring vowel cluster, usually representing /ɔ/. Hanna got more consistency by counting the *i* in words such as *action* as /sh/ and the *o* as /ɔ/. Dewey (7) developed a unique practice of giving half credit to both consonant and vowel.

Debates on such items could go on indefinitely. In *sign*, is *ig* the spelling of /i/ (Hillerich) or is *gn* the spelling of /n/ (Hanna)? In *diamond*, is *ia* the spelling of /i/ (Hillerich, Dewey) or does *i* represent /i/ and *a* /ɔ/ (Hanna's spelling pronunciation)?

Teacher's Considerations

Rather than focus on such disagreements, teachers should look at the practical implications. For example, how does one pronounce the nonce word *wriat*? If the reader uses the Dewey and Hillerich classification, it is *write*; the Hanna classification leads to *riot*. The correct pronunciation can be determined only if the word is already known—or if one is using context and also has the word in his listening/speaking vocabulary. In the latter case, however, the consonants alone would have been as helpful.

As a result of the many analyses which have been made of the language, this writer finds that rules relating to vowels seem to fit neatly into two categories: 1) rules that apply to many words but which are not often true or 2) rules which are true most of the time but which apply to very few words. Is either rule worth teaching?

Effectiveness of Teaching Vowel Generalizations to Children

This author is still too much of a practitioner to accept armchair analyses of language as a final answer when it comes to children and learning. What are the effects of teaching vowel generalizations to primary grade children?

There is considerable research dealing with the generalization approach in spelling and also with intensive versus delayed phonics reading. Unfortunately, however, specific research relating to the effectiveness of teaching vowel generalizations in reading is limited. Most effort has been devoted to analyses of the language itself.

First of all, since there is at least agreement that the major vowel graphemes each represent more than one sound, basic studies by both Levin (19) and Williams (21) point in a consistent direction. These researchers investigated the relative merits of successive versus concurrent presentation of the multiple correspondences between grapheme and phoneme. For example, when *ai* may represent /e/ (*said*) or /a/ (*paid*), is it better to teach one correspondence at a time (successive) or both at once (concurrent)? Both investigators found the concurrent approach best; children taught each generalization separately seemed to develop a mind set for consistency and became more easily confused when faced with the irregularity of the natural language.

Hillerich (15) studied the effectiveness of teaching vowel generalizations to first grade pupils. He compared all first graders ($N = 742$) in two comparable school districts in terms of reading achievement at the end of grade one. In the one school district, first graders were taught vowel generalizations as part of the reading program; in the other school district, they were not. Results at the end of the year indicated that those pupils who had not been taught vowel generalizations scored significantly higher in reading achievement. Most important, the entire difference in reading achievement of the two groups was reflected in the subtest of comprehension, suggesting that excessive attention to the vowels led to overanalysis of words rather than to concern for meaning.

In a follow-up study, Hillerich (16) investigated the effectiveness of teaching about vowels in second grade. In this study of six classrooms, two classes of second graders were taught vowel generalizations, two were taught about vowels only at the hearing level, and two classes were not taught anything about vowels during the entire second grade year. At the end of the year, the reading achievement test indicated that those who had been taught only at the hearing level (to listen for and to recognize the various vowel sounds) scored significantly higher than the next highest group, which was the group that had not been taught anything about vowels. The group that had been taught vowel generalizations was significantly lowest in reading achievement.

This latter study not only points up the weakness of teaching vowel generalizations, but underscores the importance of an auditory emphasis. In working at the hearing level, second graders were not taught a letter-sound generalization; they were taught to identify a particular vowel sound under discussion, to see how many other words they could find with that same vowel sound, to list those words, and to classify them by spelling pattern. Such experience is truly inductive; it is discovery without the usual rigged sample, since it releases children to the entire world of language. Further, this emphasis on listening and classifying the sounds is in keeping with the findings of Bateman (2) and others: an auditory emphasis is most effective in beginning reading, regardless of preferred learning modality.

Rather than add to the many research studies on the effectiveness of "phonics" in reading, this author would suggest the need for more controlled research on which specific elements of phonics contribute to reading success. Further research in this area is certainly needed to support or reject the findings proposed here. Meanwhile, just because "we have always taught vowel generalizations" is poor justification for continuing such instruction. From the view of research, as opposed to tradition, it seems that the burden of proof ought to be with those who seek to continue teaching vowel generalizations.

Conclusion

The writer finds that, from the standpoint of analysis of language, vowel generalizations have little validity; from the standpoint of instruction with primary children, they have little effectiveness.

On the other hand, the vowel symbols and sounds do exist in the language and cannot be ignored. Once children are underway in reading, opportunity to explore the vagaries of vowels can be helpful. However, the vowels should not be taken too seriously—and here's the rub! Children have difficulty with vowel rules and are often given extra practice sheets on vowels. Such activities require time for filling in blanks—time which could be devoted to reading or to having fun exploring the language. Most teachers recognize that, once started, children also learn to read by reading.

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This paper offers information which should help teachers better understand the letter and word identification problems of their students. Reversal errors may not be due to reversals of the perceptual process.

Letter Recognition Difficulties: Their Real Nature

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The purpose of this study was to explore the letter recognition difficulties of a group of largely first grade children from lower socioeconomic families. In an effort to better understand both the letter and word identification problems of these students, objectives included the determining of a rank order of difficulty of correct letter identification, the learning of how frequency of letter use affected ease of identification, and the gathering of information about both the aspects of the appearance of the letters and the perception of the students.

Sample Studied

Subjects were 322 children who, in October 1972, had failed to decode three or more words on the first grade word list of the Durrell Analysis of Reading Difficulty. Most of the children were first graders.

Method

Each child was asked individually to name all the lowercase letters which were presented in scrambled order. Each response was recorded to find out which letters were mistaken for others. All responses were tallied, and an error frequency chart was made. The figures from this chart were correlated with figures for the frequency of letter use in English derived by Friedman (2). The incorrect answers were statistically studied to differentiate between random and systematic errors. The systematic errors were then studied in an effort to discover which factors made it difficult for these letters to be named correctly. The errors of 34 children were studied to determine if they made errors in consistent ways as individuals and/or as a group. The reversals noted were

compared with the reversals that could be predicted from Stratton's study (6), which stated that all children go through a period in perceptual development in which a specific type of reversal is made. Finally, certain frequently reversed pairs of letters were considered, such as *b* and *d*. Since *d* was systematically given as the answer when children looked at *b*, did these children make the error the other way also? That is, did they say *b* when they looked at *d*?

Findings

A frequency chart of errors made revealed surprising findings. Space requirements do not permit the inclusion of all the findings, but here is a rank order of the letters in order of decreasing difficulty of correct identification, together with the percentage of error made in each case.*

1. l-76%	10. u-38%	19. z-23%
2. q-64%	11. v-34%	20. p-21%
3. g-58%	12. n-31%	21. k-20%
4. d-51%	13. y-27%	22. e-20%
5. t-48%	14. r-27%	23. x-15%
6. b-44%	15. f-26%	24. c-14%
7. h-42%	16. w-25%	25. s-13%
8. a-40%	17. i-24%	26. o-7%
9. j-38%	18. m-23%	

By far the most frequently missed letter was *l*. Only 21 children said "I don't know" when asked to name it. Of the 225 who named it incorrectly, 146 said *I* (or *i*), and 66 said *one*, with 13 others making random errors. Apparently these two strongly systematic errors represent inadequately differentiated perception. That is, the *l* grossly resembles *I* (or *i*) and *one*, in that each of them has an easily recognized long straight line as its major component. What differentiates each of these forms from the others is the presence of smaller, less obvious components which apparently are not differentiated or perceived as easily. What makes *l* the hardest letter to identify is not reversal, but simply gross or undifferentiated perception! The complete table of errors suggests that many other errors are caused by gross perception.

Surprisingly, the rank order correlation between ease of letter naming and frequency of letter use was .076, which falls far short of statistical significance. Apparently, beyond a minimum of frequency of use, correct identification depends upon other factors.

* A complete table of findings will be sent to anyone sending a self-addressed, stamped envelope to Dr. Marvin Cohn, Reading and Study Center, Adelphi University, Garden City, New York 11530.

An examination of the efforts of 34 individual children yielded 195 errors. Of these, 63 were apparently reversal errors and 132 were gross differentiation errors. The 63 reversal errors were apparently made by going in three different directions, as follows:

Letter remains flat, as on a tabletop but is rotated 180°.	10 errors
Letter "lifted off paper" with top and bottom changing places.	17 errors
Letter "lifted off paper," with right and left edges changing places.	36 errors

The Stratton (or double reversal) error, which as far as is known occurs in all children until it is eliminated due to maturation, seems to account for 16 percent of the *b, d, p, q* reversals made by the 322 children. In fact, evidence shows that these children do not reverse in any consistent direction.

This suggests the possibility that the distinction we have been making between so-called reversal errors and letter recognition errors, apparently due to gross or undifferentiated perception, is artificial. Reversal errors may not be due to reversals of the perceptual process. They can be due to failure to differentiate the less obvious characteristics of letters which otherwise resemble each other. For example, *b, d, p,* and *q* all share certain obvious characteristics—a long, straight line which is tangent to a circle. What is probably more difficult to perceive is somewhat more subtle: Is the circle to the right or left of the straight line? Is the circle tangent at the top or the bottom of the line? Is the bottom of the line lower or at the same height as the bottom of most other letters? Difficulty in correctly naming these four letters could come from reversal of perception; it could also come from failure to differentiate and observe the small differences which identify one letter rather than others. A careful examination of the systematic errors made suggests that, even if we were to attribute all possible reversal errors to a process of perceptual reversal, these same children would still make a larger number of gross differentiation errors on other letters not involving such reversals. In any case, such perceptual twisting does not occur on a consistent basis. About as many children say *b* for *d* as say *d* for *b*, but this does not apply to other such letter pairs. Not one of the 322 children who looked at *b, p,* or *d* said *q*, in spite of the fact that of the 150 incorrect guesses for *q*, 137 children said *b, p,* or *d*! Similarly *t* was miscalled *j* 40 times, but of 69 children who miscalled *j*, only 2 said *t*. Other examples abound.

"Ockham's Razor" (the principle of parsimony) is a principle of economy in offering explanations of causality. "Plurality is not to be

assumed without necessity. What can be done with fewer assumptions is done in vain with more" (5). Gross differentiation can easily account for the nonreversal errors we see; it may also account for most of the errors that look like reversals. In fact, gross differentiation is commonly regarded as a characteristic of immature perception. Werner (7) says "... whenever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration." Gibson (3) states that perception develops "... by differentiation of stimuli already rich in information." It consists of "... learning to extract the information ... that has not already been detected and utilized. What is learned are distinctive features, invariants, and higher orders of both. . . ." We cannot rule out the possibility that some small proportion of our sample suffers from abnormal distortion of perception. The vast majority of the research evidence collected suggests that, for most children, the problem is one of delayed maturity of perception. The writer has found four studies (1, 4, 8, 9) which compare the ability of children of increasing age to identify letters. They agree in showing that this ability improves with age, as would be the case if the problem is primarily one of learning to increasingly differentiate perception as one grows older.

The children's errors found in this study suggest that errors of gross differentiation are also made in other areas as well as in the visual area. Thus, many systematic errors are found in which the wrong answers do not resemble the original letter visually but do resemble it in that the letter names rhyme, or otherwise resemble each other in an auditory way. It might be expected that letters which resemble each other in both the visual and auditory modes would be extremely difficult for children to name correctly. Indeed, of the letters *b*, *d*, *p*, and *q*, all but *p* are among the seven hardest letters to identify. Further, in identifying *b*, *d*, and *p* (whose names rhyme), although wrong letters were guessed 259 times, not one child said *q* (the visually similar but nonrhyming response). Oddly enough, of the 150 wrong letters guessed when the children looked at *q*, 119 said *p*, 12 said *b*, and 6 said *d*.

It seems reasonable to assume that letters which have two different forms, depending on whether they are in upper or lowercase, would be more difficult to identify than letters which have the same form in both upper and lower cases. This study's error frequency chart shows that of the ten easiest letters to name, nine have substantially or completely different forms in both cases. Of the letters *b*, *d*, *p*, and *q*, which are generally recognized as being difficult to name correctly, only *p* has the same form in both cases.

It is not necessary to assume the existence of perceptual reversal to account for the general difficulty in naming *b*, *d*, *p*, and *q*. All of them are look-alikes, three of them are sound-alikes, and three of them necessitate

learning two different forms for the upper and lower cases instead of one single form as many other letters do.

Still another apparent problem was found in gross differentiation. Many systematic errors were made which did not reflect either visual or auditory resemblance. If the children were not yet sure of these letters, they might tend to say one for the other simply because they were associated with each other by being studied at the same time.

Educational Implications

In teaching the alphabet, it will be useful to know rather than guess which letters are the most difficult to learn. When dealing with easily confused letters, it can also be helpful to call attention to the less readily perceived visual and auditory cues that differentiate them. It might be helpful too, to teach the letters in carefully selected groups designed to minimize confusion.

The teaching of decoding goes on frequently before the child has completely learned to identify all the letters. It might be helpful to teachers to know that the child is often unaware of the specific nature of some of the simplest looking letters, such as *l*. Even *a*, the first letter of the alphabet, is not easily recognized. Finally, it might be helpful to recognize that letter and word recognition difficulties probably represent immaturity of perception (which can naturally change with time and patience) more than they represent distorted, abnormal perception. We may be doing an enormous disservice by identifying many children as having "reading problems" or "learning disabilities" on the assumption that their perception has matured and is distorted or otherwise faulty. Possibly many of them would not have long-term learning problems if we recognize that they are just maturing more slowly than others, instead of inaccurately labeling them and putting them through learning programs for which they are not yet ready. We may thus be producing unnecessary failures. The presence of abnormal perception should never be assumed simply because youngsters manifest delayed letter and word recognition.

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Comprehension Development

This paper presents a pragmatic model for monitoring comprehension assessment and instruction.

Reading Comprehension: A Pragmatic Approach to Assessment and Instruction

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Comprehension continues to be one of the most controversial areas of reading assessment and instruction. Although there is an abundance of research in the area, there exists a paucity of empirically conclusive data and much which does exist is fragmented or pragmatically useless. In many ways, the following statement written by Thorndike (12) in 1917, still reflects the limits of our knowledge concerning reading comprehension.

Understanding a paragraph is like solving a problem in mathematics. It consists in selecting the right elements of the situation and putting them together in the right relations, and also with the right amount of weight or influence or force for each. The mind is assailed as it were by every word in the paragraph. It must select, repress, soften, emphasize, correlate and organize, all under the influence of the right mental set or purpose or demand.

Obviously, many factors have contributed to our present lack of knowledge concerning comprehension. Since comprehension is a covert process, our current lack of descriptions of the mental processes involved in reading comprehension seriously limits our ability to isolate and identify the operations taking place. In addition, inadequate research methodologies and unsophisticated measurement instrumentation have seriously hampered progress. Finally, the absence of a sound theoretical base has tended to dissipate any unified approach to solving the problems in the area.

A Brief Overview of the Research Literature

Although one might broadly interpret Thorndike's early studies as attempts to examine the components of comprehension, it was not until sometime later that significant attempts were made toward isolating these components.

Some of the more important of these early efforts were carried out by Berry (1), Dewey (4), Richards (11), Touton and Berry (14), and Traxler (15). Most of the studies were based on correlational type studies or logical guesses and the list of subskills produced were extensive, quite probably leading to some of the confusion in terminology which still exists today.

In the late 30s and early 40s, the procedures of factor analysis began to be applied to the problems of isolating the various subskills of comprehension. Although Davis (2) is generally credited with the most important of the early factor analysis of comprehension skills, it is worth noting that at least three significant factor analysis studies had preceded his. As early as 1938, Feder (5) used factor analysis techniques to analyze a matrix that included tests of factual reading, inference reading, appreciation, and speed of reading. From specially built comprehension maturity tests, Feder obtained data indicating that reading for information and reading for inference are relatively independent skills.

Langsam (9) reported a study, using college freshmen as subjects, in which she administered reading tests yielding fourteen scores and an intelligence test yielding seven scores. After applying Thurstone's Centroid Method, a factor analysis, she was able to identify five factors: 1) verbal, 2) perceptual, 3) word, 4) number, and 5) seeing relationships.

An unpublished study by Pankaskie (10) analyzed the Iowa Silent Reading Test, Iowa English Training Examination, and Iowa Mathematics Aptitude Test. Results indicated the presence of three factors: speed of comprehension, vocabulary, and ability to find answers to questions. Subtests of the Iowa Silent Reading Tests were not found to be pure measures of these factors.

Probably the best known of the early factor analytic studies of comprehension was that of Davis (2). His effort purportedly was the first "that made use of tests especially constructed to measure the mental skills in reading regarded as of greatest importance by authorities in the field." After extensive research, he came up with a list of nine testable skills:

1. Knowledge of word meanings.
2. Ability to select the appropriate meaning for a word or phrase in the light of its particular contextual setting.
3. Ability to follow the organization of a passage and to identify antecedents and references in it.

4. Ability to select the main thought of a passage.
5. Ability to answer questions that are specifically answered in a passage.
6. Ability to answer questions that are answered in a passage but not in the words in which the question is asked.
7. Ability to draw inferences from a passage about its contents.
8. Ability to recognize the literary devices used in a passage and to determine its tone and mood.
9. Ability to determine a writer's purpose, intent, and point of view, i.e., to draw inferences about a writer.

Davis computed the intercorrelation among the nine tests and interpreted a factor analysis of the results as indicating the presence of nine factors. Six of the nine factors were subsequently established as being significant at the .05 level; however, of all the factors, word knowledge accounted for the greatest part of the variance. Reasoning in reading ranked second, followed by the literal meaning factor. Even though the factor analysis did identify six components, Davis concluded that only components 1 and 2 (word knowledge and reasoning in reading) "are measured with sufficient reliability to warrant their use for practical purposes." Two years later, Thurstone (13) reanalyzed Davis' data by Spearman's Unidimensional method and concluded that a single common factor (reading ability) accounts for the correlations among the tests with residuals remarkably small in view of the fact that the tests were designed to test nine supposedly different skills.

Harris (7), in a study equivalent in nature and scope to that of Davis, arrived at conclusions similar to those of Thurstone.

From this study it is concluded that one general factor is adequate to account for the intercorrelations of the seven variables, each of which specifies a particular behavior or skill that was defined as an aspect of comprehension of literature. It should be noted particularly that group factors were not found.

In a study similar to that of Davis, Hunt (8), reexamined the six skills earlier identified by Davis as being fundamental to reading comprehension. For the comprehension skills considered, other than vocabulary, he determined that the average differences between the point biserial values for each pair of skills measured were probably chance differences. He concluded, "It would appear, then, that what is being measured by each of the six skills examined in the study is to a large extent general reading comprehension and to a lesser extent, vocabulary or isolated word knowledge."

On the other hand, Hall and Robinson (6), found quite different results when they factor analyzed the data from a battery of tests which included twenty-five separate reading measures, many of which were

tests of reading nonprose material. Their findings showed the existence of six factors, one of which was not identifiable:

1. Attitude of Comprehension Accuracy
2. Rate of Inductive Reading
3. Verbal or Word Meaning
4. Not Identifiable
5. Rate for Unrelated Facts
6. Chart Reading Skill

Further justification for the multifactor theory of comprehension is supplied by Vernon (16). He found general comprehension and vocabulary to be separate factors and, on the basis of his data, notes that a distinction can be made between inferential and factual comprehension.

Probably the strongest argument for a multifactor theory of comprehension was provided by Davis (3). Using a set of carefully constructed tests designed to measure specific aspects of reading comprehension, he reinvestigated the unique variances of subtests of reading comprehension. In this study, he used "a cross-validated unique analysis based on large samples of examiners." On the basis of a rather impressive study, Davis concluded that "comprehension among mature readers is not a unitary mental skill or operation." His factor analysis indicated that 32 percent, the largest percentage of unique variance, occurred in the case of Skill 1 (memory for word meaning) and the second largest percentage, 20 percent, occurred in the case of Skill 5 (drawing inferences from content). Three other skills which showed appreciable percentages of unique variance were Skill 8 (following the structure of the passage), Skill 6 (recognizing a writer's purpose, attitude, tone, and mood), and Skill 3 (finding answers to questions asked explicitly or in paraphrase).

Although the studies mentioned do not exhaust the literature dealing with reading comprehension, they do constitute a representative sample of the research in this area. Even from this limited review of the literature, the lack of consistency is obvious in findings regarding generalities and specificities of comprehension abilities. There is widespread disagreement among educators, not only as to the specific subskills of comprehension, but also as to whether such subskills exist.

Despite the confusion, there does appear to be a growing amount of evidence emerging in support of a multiskill theory of comprehension. The majority of the research suggests that most of the measurable variance in tests of reading comprehension can be accounted for in terms of a small number of factors, perhaps six to eight. In addition, an examination of the research literature indicates that most of the so-called comprehension subskills are not discrete skills but are superficially varied interpretations of the same skill.

A Pragmatic Approach

Despite the divergence of opinion and inconclusiveness among educators concerning comprehension and despite the limitations in methodology, instrumentation, and understanding of covert processes in reading, on the basis of present knowledge, one still sees the need for developing a pragmatic approach to assessment and instruction. This, then, is the focus of the present effort being carried out at the Wisconsin Research and Development Center, an effort to organize and clarify the area of reading comprehension. From the beginning, the primary purpose has not been to either agree or disagree with what has been done traditionally, but rather to discover through research what actually happens in reading comprehension. This should not be taken to suggest that the enormous quantity of research accumulated over the past fifty years has been ignored. Neither should it be misconstrued as failure to recognize the vast amount of experience and knowledge available from classroom teachers. Indeed, both of these resources have made immeasurable contributions to the project. Attempts are being made to proceed beyond the information presently available by going into the classroom to discover what children can and cannot do, and which of their needs are not being met.

Before describing the program, it seems wise to discuss briefly the assumptions, parameters, and limitations of the approach under study. First, one should be aware that the present effort deals only with *reading comprehension* as distinguished from *comprehension* in the more general sense. It is incongruous to label a student as having a problem in reading comprehension if that same student, because of intellectual, physical, or psychological problems, is incapable of comprehending information presented in forms other than written material. One assumes that this student has a comprehension problem rather than a reading comprehension problem. And while it is recognized that this student's problem merits attention, it does not seem appropriate to deal with it here.

In further defining the comprehension approach under development, it is necessary to distinguish between skills requiring convergent thinking and those allowing divergent thinking. Unfortunately, many testing and instructional materials have failed to make this distinction, thus contributing to much of the confusion in the area. Convergent thinking is involved in such skills as identifying topic sentences, determining sequence, and recall of detail, all of which require the reader and writer to gain some common meaning from written materials. If they do not find an area of convergence, communication breaks down. When a writer offers a series of events that are sequentially related in some fashion, it is important for the reader to comprehend what that

relationship is. To this extent, there are right and wrong answers not open to interpretation.

Divergent thinking, on the other hand, offers no right or wrong answers. When a child is asked for *his* interpretation of a poem, *his* opinion of a character, or *his* evaluation of a situation, his answer, by definition, will always be correct.

While it is recognized that both convergent and divergent thinking are important and necessary to a total program in reading comprehension, there are problems, presently insurmountable, in measuring and providing instruction in the latter. Consequently, the program presently being developed has, as an operational constraint, chosen not to deal with divergent thinking.

Recognizing that reading comprehension is a covert process, thereby disallowing the accumulation of information through direct observation, the developers chose to proceed through use of behavioral objectives. Comprehension skills, selected on the basis of logical, historical, and empirical research, have been arranged by strands and placed in a sequential order. The seven levels in the hierarchically arranged list of skills are labeled A through G, roughly approximating grade levels K-6. Each step within a strand represents a discrete skill built on, or subsuming, previous skills within that strand.

Thus far, this paper has dealt with the more general operational constraints and basic assumptions of the program under development. More specific information dealing with other aspects of the program can be best explained through a discussion of the individual strands.

The Main Idea Strand

The structure and organization of the main idea strand is somewhat different from the traditional approach. Otherwise, the strand is representative of the ideas and concepts which teachers have always offered in this area of comprehension. The skills deal primarily with the student's ability to recognize or infer the main thought or central idea expressed in the information given, and they emerge as a progression of hierarchically sequenced skills moving from the concrete to the abstract.

The most basic skills in the main idea strand involve the identification of topics. The ability to draw together and somehow conceptualize the central thought conveyed in expressed information is the foundation for the entire strand. By introducing the skills through pictures (Level A) and oral presentations (Level B), the teacher can develop the concepts involved without being handicapped by the decoding task. The student does not assume the decoding responsibility until Level C.

Instruction in locating the topic sentence (Level D) helps prepare the student to take advantage of organizational aids incorporated into

written information, and represents the highest level of literal interpretation in this skill. The remaining levels require the use of inference in identifying the main ideas of one- and two-paragraph selections.

As this brief description illustrates, the term *main idea* is interpreted as global, subsuming a number of discrete subskills. Instruction in inferring the main idea, without the proper prerequisite skills, yields diminishing returns and is likely to be unsuccessful. Likewise, no matter how intense, instruction which never moves beyond the elementary concepts will probably never raise the student to a level of proficiency which will satisfy his comprehension needs.

The Sequence Strand

The sequence strand, like that of the main idea, is handled quite traditionally and should not prove difficult for either teacher or pupil. The strand deals mainly with the student's ability to properly sequence pictures or events on the basis of information provided in the stimulus materials.

It is important to point out that all of the necessary information to establish sequential relationships should be introduced in the stimulus materials. If the assessment items deal with sequential relationships with which the child is already familiar, he will likely establish the sequence from experience, thereby not proving an accurate measure of his ability to do so in written materials.

The most obvious events in a sequence are the first and last, and this is where the strand begins. Though not difficult to perceive, these two concepts are extremely important to the development of sequence. The child must learn not only the concepts themselves, but what they represent in relation to one another.

Logically following are the concepts *before* and *after*. In a real sense, this skill is an extension of the earlier one since some events come after the first event or before the last and necessarily subsume those concepts. These same concepts are expanded at Level C where the child is given the additional responsibility of the decoding task. In fact, the first two levels are prerequisite to Level C since it is here that the student first applies them to written text.

At Levels D and E the skills deal with explicit relationships—i.e., those relationships pointed out by specific cue words such as *next*, *finally*, and *then*. Insignificant as they may appear, successful mastery of these skills can provide the student with a quick and easy tool for recognizing most sequential relationships in all areas of his reading.

The skill at Level F, recognizing implicit relationships, is much more subtle and involves a great deal of inference. Implicit relationships—those identifiable from the context of the passage—require careful

attention of all of the information provided in the written materials. They also require a degree of elementary reasoning—e.g., the boy could not have eaten the cake before it was baked or found his lost toys before they were lost. While the relationships are not pointed out by specific cue words, they are identifiable by the proficient reader who understands the material.

At Level G, the skill involves the use of a timeline. This is the highest level of sequence and the child's ability to respond satisfactorily here should indicate that he has successfully mastered the lower level sequence skills and can readily apply them in appropriate situations.

The Context Clues Strand

The context clues strand emphasizes the use of contextual aids in determining the meaning of unknown or unfamiliar words. In addition, it stresses the use of context in deriving unfamiliar meanings of familiar words which occur in everyday language.

Skills in the use of context clues appear only at levels D, E, and G. At level D, the skill involves the use of direct description and cause-effect context clues. Direct description clues are those words or phrases that describe other words or phrases in a selection. Cause and effect context clues are somewhat different but no more difficult. The clue lies in the cause-effect relationship between the two parts of the sentence. For example: "Because Bill hated to wash dishes, he _____ volunteered for the job." Obviously, if Bill disliked the job, the missing word must indicate that he would not volunteer often. The unknown word must mean something like infrequently, rarely, or seldom.

The skill at Level E is essentially the same as that at Level D. The only difference between the two levels lies in the introduction of the use of contrast as a context clue. An example using contrast follows: "Instead of being worth a lot of money, as he had hoped, John found the stone was _____." The words "instead of" provide the clue that the stone was not worth a lot of money. Consequently, one must infer that the unknown word means of no value or worthless.

The Level G skill involves the use of context clues in determining the unfamiliar meaning of familiar words. For instance, the word *ties* is generally familiar to most children as meaning neckties; or as meaning equal, as in scores or votes; or as meaning binding something, as with a string. A fourth definition and one less familiar, would be appropriate for the meaning of *ties* in the following selection: "Railroad tracks are attached to heavy wood supports underneath. These *ties* lie crosswise about one foot apart." In order to determine the meaning of *ties*, the student must use the context clues in the selection to derive a new meaning for the word.

Context clues and affixes in determining word meaning are the two strands associated with vocabulary development. Although vocabulary development is not a skill in itself, the tools associated with it may be described as skills.

The Affixes Strand

In this strand, the skills center around the student's ability to interpret suffixes and prefixes as they are related to vocabulary meaning. The emphasis here is toward semantics—i.e., how the affixes change or modify the meaning of words.

Although the leveling of various suffixes and prefixes is mainly arbitrary, the levels do reflect extensive input from classroom teachers and research into instructional materials. The rationale is to introduce the affixes, as nearly as possible, at levels where they are most frequently included in curriculum instructional materials.

The only differences among Levels E, F, and G are the kinds of affixes—prefix or suffix—and the affixes themselves. The suggested instructions and assessment activities for all three levels are exactly the same. Consequently, it does not seem necessary to discuss each level separately, as was done with other strands.

The Reasoning Strand

Probably the most neglected skills in teaching comprehension, but possibly the most important, are the reasoning skills. In the past, these skills have generally been handled in a hodgepodge, hit or miss fashion and student comprehension scores show it. Beyond teaching some educational cause-effect relationships and predicting outcomes, the educational system has failed to provide the student with the appropriate tools for reasoning through a problem. In this sense it has failed him.

Fortunately or unfortunately, as the case may be, this generally has not been the fault of the teacher. Most curriculum materials fail to treat this area or if they do, they treat reasoning as a summary or global activity. Few programs have attempted to identify and isolate the individual skills in reasoning and, consequently, the teachers have been left with little or no materials for providing assessment and instructional activities.

It was out of this need for the identification and isolation of specific skills that the reasoning strand developed. In its present form, the reasoning strand represents not only substantial input from research literature and teachers, but reasoning skills actually being employed by elementary school children. Through extensive testing and retesting, an

attempt is being made to identify essential reasoning skills and place them at appropriate levels for instruction in the reasoning hierarchy.

In organizing the reasoning strand, it was necessary to subsume under other titles some of the traditional categories and labels used in comprehension. In addition, it was necessary in some cases to insert new titles to cover skills previously neglected or confounded with other skills. While the new terminology may at first appear somewhat confusing, in time it should prove to be even more functional than the traditional.

No matter what terminology is used, most teachers seem to agree that much of what is called reasoning depends on the child's ability to draw conclusions based on some type of hypothesis. This means that the student is faced with a problem or unknown outcome, and must test various solutions to that problem to determine the correct answer. Contrary to the belief that the "working out" of a problem is some global, mystical process which some children can accomplish and some cannot, the program assumes that most children can be taught to reach a sound conclusion through systematic, organized thinking. It also assumes that the rules and processes in reasoning can be isolated and taught in a hierarchical structure, moving from the basic to the sophisticated.

The first two skills in the reasoning strand involve synthesis of information and predicting outcomes. Both are traditional skills and should provide no difficulties. Building on these abilities, the next skill involves the recognition of cause and effect relationships. The child here must identify whether pairs of events are causally related.

Identification of such relationships should prepare the child to recognize a basic form of deductive reasoning. He should be ready to deal with the same kind of relationships in logical arguments, in addition to his own personal experience. This leads to the introduction of formal reasoning, which starts with the decision of whether a conclusion correctly follows from the argument given. (If all boats on the lake are sailboats, and John's boat is on the lake, then it is correct to say that John's boat is a sailboat.) The child must also be able to ignore irrelevant information that may accompany the argument. The same skill is employed at Level E, but here the logical arguments may be longer and the order of some of the arguments is altered to reflect the way these arguments are often presented in common speech and writing.

The next step in deductive reasoning is to recognize that some conclusions do not follow from an argument (Level F). For example, to say that all boats on the lake are sailboats and that John's boat is a sailboat does not mean that John's boat is on the lake. This is a critical step in deductive reasoning, since the child must begin to recognize the limits of a logical argument. At Level G, this notion of limits of an argument is extended to include the recognition of arguments irrelevant to a conclusion and also to the recognition that arguments may be stated in

an order that is the reverse of the logical meaning of that argument. For example, to say that Jane likes all country/western music means that if it is country/western music, Jane likes it—not, if Jane likes it, it is country/western music.

Two other skills are included in the reasoning strand. At Level F, the child identifies whether a fact is an instance of a general argument or principle; and at Level G, this relationship is reversed and the child identifies what general argument or principle would account for a given fact. This latter skill represents the well-known process of inductive reasoning where one identifies general principles from specific facts.

Reading for Detail

Traditionally, the term "reading for detail" has been applied to a wide range of activities and operations. It has been represented by everything from simple matching exercises to sophisticated levels of inference and reasoning. Even on standardized tests, one is likely to find represented as many as four or five different subskills, with no apparent attention given to the differences in cognitive processes and operations involved.

The approach to the reading for detail strand is similar to that followed in the reasoning strand. It attempts first to identify the subskills involved in the global process, and then to place these subskills in a hierarchical pattern for instructional purposes. It strongly disagrees with the basic assumption, made by many instructional programs, that the student merely reads "reading." Instead, the program assumes that the student reads written information expressed in the active and passive voices and which contains negatives, subordinate clauses, embedded parts, and other syntactical structures. Because he can answer detailed questions about information expressed in the active voice in simple sentence structures, one has reason to believe he can perform equally satisfactorily when working with the passive voice or with difficult syntactical patterns. In addition, there is no convincing evidence that teaching elementary patterns and structures over and over will change them into sophisticated patterns and structures. A review of the research literature and pilot research studies has shown that there are important differences between subskills in reading for detail and that a skill hierarchy exists.

The most basic skill in reading for detail requires the student to comprehend information presented in the active voice—i.e., in sentences where the subject performs the action of the verb. This is the most frequently used structure in speech and writing and is representative of the traditional approach to instruction in detail at this level. At the next level of reading for detail, the use of the active voice is continued and the

child also assumes the decoding responsibility. In addition, at this level, the child is introduced to the use of negatives.

It is not until Level D that the skills begin to depart from traditional instruction in reading for detail. At this level, the child is required to work with information presented in the passive voice—i.e., the subject is acted upon. For example, it is here that he begins to understand that the words "John hit the ball," and "The ball was hit by John," carry the same meaning. Traditionally, little instruction has been given in reading the passive voice; yet, children are expected to comprehend information presented in it. The transformations from active to passive or passive to active should not be taken for granted. In reality, they constitute a relatively complex process.

A second skill at this level of reading for detail concerns the interpretation of information in introductory and terminal subordinate clauses. "When he came in out of the cold, John went directly to the stove," is an example of an introductory subordinate clause. An example of a terminal subordinate clause is, "He stood by the stove while he vigorously rubbed his hands." In both examples, the student will not get all the information presented if he overlooks the clause or fails to incorporate and synthesize the information presented in it. The major focus of this skill is on gaining and synthesizing information from the subordinate clauses.

The skill at Level E, dealing with embedded parts, represents one of the most difficult constructions with which the child has to contend. When the relationship between the subject and verb is interrupted by an embedded phrase or clause, the process of understanding is broken for many children. Consider the following example: "The lifeguard, seeing the swimmer in trouble, dived into the water." The student who keys in on only the first part of the sentence, or only on the last part, will undoubtedly miss part of the information. He is likely to confuse such details as who was in trouble, who dived into the water, or what exactly took place. By providing the student with an understanding of how the various parts of the sentence fit together and what information may be provided in each, he can be taught to deal with the various sentence structures which most often impede comprehension.

The skill at Level F subsumes the skills at Levels D and E in that it requires the student to process information contained in sentences having both embedded parts and introductory or terminal clauses. This is the highest level of reading for detail, and students who show mastery at this level may be assumed to be masters of skills at all previous levels.

In teaching the skills in this strand, as in all other strands, it is especially important to be aware of the student's decoding ability. Even though expertise in decoding is no guarantee of proficiency in com-

prehension, the lack of adequate decoding skill is almost certain to seriously hamper comprehension.

Summary

The approach to reading comprehension described here is not offered as a definitive solution to all problems associated with assessment and instruction in the area. It leaves unanswered many questions concerning information processing, and in some cases is built on historical or consensual assumptions yet to be empirically verified. However, as a pragmatic approach to the solution to a major problem in contemporary reading education, it does offer a number of advantages not previously available. It proceeds on the basis of operational definitions. The parameters, assumptions, and operational constraints, as well as the skills, strands, and hierarchies, are described explicitly to allow empirical verification. In addition, every attempt has been made to control for such confounding factors as intelligence, decoding, and previous knowledge and experience. Insofar as possible, the materials are designed to test only reading comprehension and its prerequisite skills.

Finally, the program proceeds from a research base. In cases for which no precedents are available, baseline data are gathered and analyzed before development occurs. In situations where information is available, the facts are verified before they are accepted. Individual skills, as well as strands and hierarchical relationships, are piloted and field tested before inclusion in the program. In the final analysis, nothing is assumed that can be tested and empirically verified.

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This paper presents a structure for teaching critical reading and offers application examples from various grade levels.

How to Teach Critical Reading

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It is the intent of this paper to suggest a new approach in the practical application of teaching critical reading from kindergarten through college. This paper reviews pertinent literature applicable to the writer's intent and advances structural steps which are applied to the actual teaching of critical reading in classrooms and subject matter areas.

What Selected Studies Reveal

Reading literature abounds in confusion, uncertainty, and ambiguity as to what reading comprehension is. Factor analytic studies of reading comprehension seem to evidence empirically that there are several discrete abilities and skills in reading comprehension. On the other hand, studies provide empirical evidence that reading comprehension consists of one general ability rather than of several distinct skills (5). Further analysis in the reading literature evidences that similar variances exist in terminology and definition of critical reading (8). Carroll (2) recommends that general ability to reason with presented information and the ability to recognize the writer's purpose, attitude, tone, and mood are something more than recalling word meanings, finding answers to questions, and following the structure of a passage.

Further, Wolf and associates (12) found evidence of a number of specific skills in critical reading and Betts (1) named three major variables with thirty-two subvariables. Kingston (7) asserted that the reader will deliberately test his previously learned beliefs, facts, concepts, and values against the contents read; that hypotheses are formulated, accepted, or repeated; and that the reasoning process results in some acceptance or rejection of the principles discussed. Other variables of critical reading are said to be cause and effect relationships, inference, precision with word meanings, thought structure, and recognition of implicit assumptions. Examination of the Watson-Glaser Test of Critical Thinking (11) reveals that Valid Inferences, Recognition of Assumption,

and Hypothesis Verifications appear to overlap with some of the variables of critical reading. Follman et al. (4) citing Gainsburg, Simmons, and Wolf, conclude that "there is a substantial overlap between critical reading and critical thinking" and that this overlap shows a "correlation of .77." Johnson et al. (6) concluded that "critical reading and critical thinking have a profound relationship with verbal ability, particularly vocabulary." Critical reading, then, appears to relate to the critical thinking and thinking activities are at least inferred into critical reading.

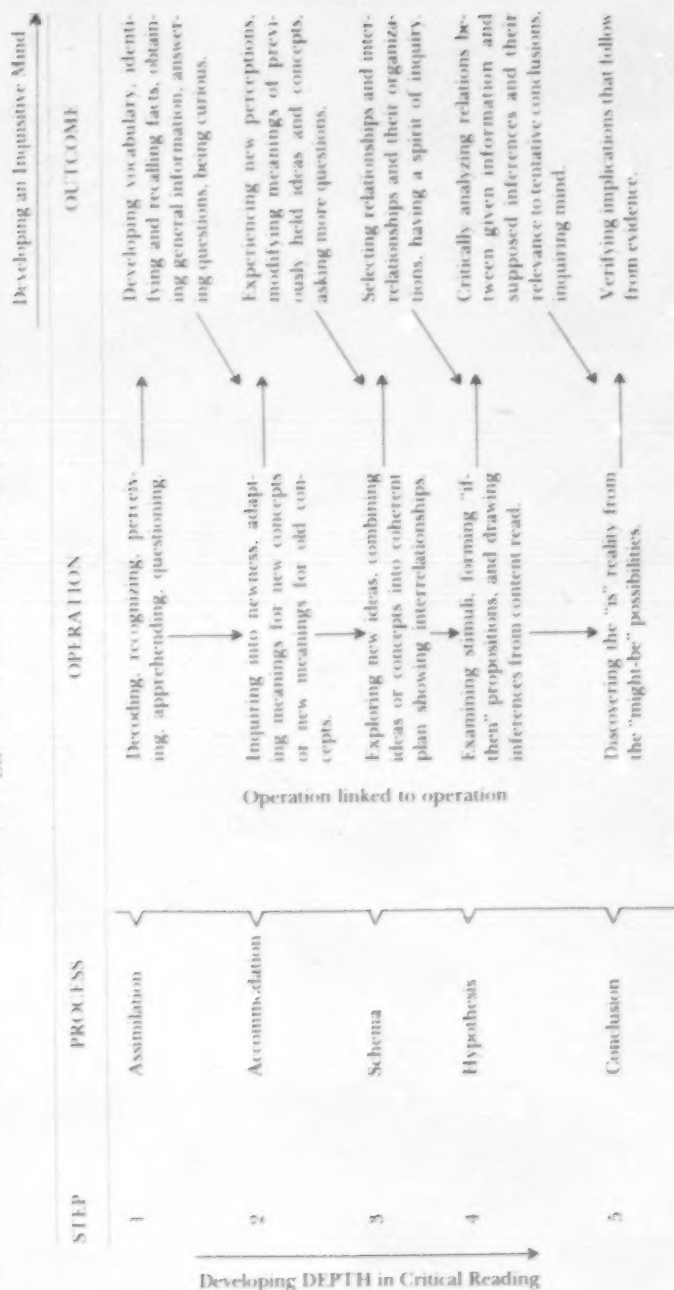
Based on these theoretical investigations, the balance of this paper is directed toward critical reading applications and how they should be taught in the schools.

An Applicable Suggestion

In an earlier paper (10) the writer asserted that critical reading begins in grade one and must be systematically developed from there on. "Instruction" in critical reading "is needed at all levels—primary, elementary, junior, and senior high grade levels and beyond" (9). The development of critical reading in depth is, therefore, a matter of degree with its operational beginning in grade one. Practices in critical reading appear to follow the same structure in processes, operations, and outcomes but, with increasing grades, are different in the difficulty and complexity of the content involvement. Within the totality of critical reading, *process* signifies the developmental activities the reader is acting upon during the *operation* whose criteria determine the *outcome* or the results of critical reading learning, and thinking.

Table 1 shows a suggested structure of critical reading as it may be usable to classroom teachers and their students. Process, operation, and outcome are given in the table to: 1) provide a plan for teaching critical reading and 2) suggest what student performances in the operational stages consist of in order to reach the desired outcome in critical reading. Following the columns vertically, process, operation, and outcome indicate increasing depth in critical reading. The sequential relationships of the horizontal operation and outcome (arrows) denote an increase in the intensity of the inquiring mind, essential in critical reading. To facilitate communication in the presented samples applicable to the chart, the horizontal arrangements are referred to as Step 1, Step 2, and so forth. Thus, a step consists of process, operation, and outcome. No step alone, nor any part in isolation, makes critical reading; it appears from the cited studies that only all distinctive skills together in their suggested relationship and interrelationship will constitute critical reading.

Table 1. A Suggested Structure for Critical Reading



Based on the suggested structure of critical reading as shown in Table 1, application samples in teaching critical reading are presented as they have been successfully tried in their respective grades by students of the writer.

Application Sample for Grade One

Reading is taken from *May I Come In?* Level 5, Primer, Reading 360, Ginn, 1969, 85.

Reading: Mr. Babbit was not in bed.

He was in the park
looking for Carlo.

- Step 1* The reader, in an assimilative approach, decodes the print, asks questions, gathers facts and information and recalls them. Who was not in bed? Where was he? Who is "he"? What did he do? Who is Carlo?
- Step 2* The reader retrieves old meanings previously stored in his memory and mixes them with the new information received which may result in modification of what has been perceived before about Mr. Babbit, Carlo, beds, and parks. The reader continues to question: Why was Mr. Babbit not in bed? Why was he in the park? What is a park? Why was Mr. Babbit looking for Carlo?
- Step 3* The reader combines new ideas with earlier ones, forms relationships and organizes them. How does Mr. Babbit know that Carlo was in the park? Why would Carlo be in the park? How does Mr. Babbit get to the park? Where may Mr. Babbit find Carlo? Why does Mr. Babbit go looking for Carlo?
- Step 4* The reader thinks of as many "might-be" possibilities to better insure the finding of all that "is" there. If Mr. Babbit does not find him, what may happen to Carlo? If Carlo is not in the park, what will Mr. Babbit do? If Mr. Babbit comes to look for Carlo, what may Carlo do?
- Step 5* The reader verifies the evidence found in the story. The reader finds the evidence and reads it:

Mr. Babbit looked up
and said, "Carlo! . . ."
He jumped on Mr. Babbit.
And away they went.

Application Sample for Grade Seven

The reading is taken from *School Mathematics, I*, Junior High School. Don Mills, Ontario: Addison-Wesley, 1971, 85.

Reading: A man needs to take a fox, a goose, and a sack of corn across a river. He has a boat in which he cannot take more than one across at a time. How can he get all three across the river, taking one at a time with him in the boat?

By grade seven, the teacher may take a less direct approach than in our grade one example. The student may be directed to draw a diagram which should assist him in finding the one possible solution. Drawing the diagram presupposes that the student already knows what to do. Without this preconceived knowledge, he cannot draw a meaningful diagram. The preconceived knowledge is the student's ability to read, gather the facts, and give meaning to them (Step 1); interpret them (Step 2); establish relationships between them (Step 3); form "if-then" propositions and draw conclusions (Step 4); and then verify them in order to arrive at the solution (Step 5).

It may be taken for granted that grade seven students (even the innermost city dwellers) do comprehend—assimilate and accomodate—fox, goose, and a sack of corn in relationship to river, boat, and the man as the mover. But do they? Mere recognition, perception, and apprehension of the words are not sufficient for adapting new meanings with the old ones nor for combining new ideas with old ideas.

To verbalize that the fox is an animal is not enough, for so is the goose; that the fox is an animal with four legs, furry, and cunning and the goose an animal with two legs, feathery, and not cunning does not help either (Step 1). It still signifies that some new meaning, yet missing, needs to be accomodated with the already existing experiences. If the student has adapted the new meaning of fox as belonging to the dog family which is related to wolves (Step 2), and if he knows the relationship between wolves and geese, and if he can develop the relationship between geese and corn, he then can proceed to establish meaningful relationships from fox to goose and to the goose and the sack of corn. Thus, he realizes that the fox eats the goose and the goose eats the corn. The solution to the man's problem of what to do begins to crystallize and, in turn, prepares the student to move from schema (Step 3) to hypothesis. If the man takes the fox across the river first, then the goose is left with the sack of corn (Step 4). Then what will happen? Why? If the man takes the goose across the river first, then the fox is left with the sack of corn. What will happen? Why? (Step. 4). The verification of the steps comes from logical reasoning about established relationships (Step 5).

Application Sample for Grade Eleven

The reading is taken from *History: USA*. New York: American Book Company, 1967, 570.

Reading: Evidences of common interests between the United States and Canada are: . . . unfortified border provides evidence of long-standing friendship between the two countries. . . . In World War I troops from the two countries fought shoulder to shoulder. . . . The principles involved in the Ogdensburg and the Hyde Park agreements were regarded by both. . . .

Prior to the assigned reading, here only partially given, the students might be asked to answer, "What demonstrations have the United States afforded the world regarding neighborly relations?" To answer this question fully, in the light of its ramifications, puts the onus on the students' abilities to read this passage critically. While some can do it, others may need teacher guidance. If students are not certain of the word *demonstration* as used in the context, this word needs to be clarified (part of Step 1).

The students may first utilize their background experiences to assimilate meaning to *demonstrations* as public displays of group feelings toward a person or a cause, a showing of armed forces, or even a display of a merit of a product (Step 1). Within the context, they will find that none of the already known old meanings makes the passage meaningful. Therefore, they need new meanings of *demonstrations*. Through discussions with their peers or teacher or by consulting a dictionary they will discover the definition of *conclusive evidence* or *proof*. The definition needs to be verified with the context and, when fitting, to be adapted within their previous meanings of *demonstrations* (Step 2).

Whatever new knowledge needs to be accommodated, it must be done in Step 2, so that the historical facts or events can be placed in chronological order as they have occurred. This is a necessary addition in the critical reading of social studies because preceding actions may well be the premise for succeeding events. In this reading, the joint defense agreement of North America precedes the Hyde Park Agreement between the two countries in order to pave the way for assisting a third pact.

So far the students have laid the groundwork to more fully grasp the historical facts from which they are building relationships, such as, unfortified borders and boundary disputes, arbitration and compromise, and trade agreements and high tariffs. (Step 3).

Caution must be exercised in letting the students develop explicit understandings of all possible relationships so that they are more fully

prepared to move to the next step of forming "if-then" propositions. It must always be kept in mind that in the critical analysis of the context, the students have to decide for themselves what is real, what could be real if, and what is not real because of it. This is an activity that belongs to the students; they must engage in it to acquire the skills to read critically and to cross the barriers from learning to thinking. Acquisition of this skill is fostered by the teacher who, through inquisitive questioning, supportive feedback, and relevant additional information, guides the students toward discovery and fulfillment of critical reading.

Hypothetical-deductive thinking is encouraged to further reduce comprehension uncertainties. It is discovering the "is" portion of the "might be" totality by hypothesizing all that might be there and "thereby of much better insuring the finding of all that is there" (3). Students are now engaging in sharper thinking processes where the scalpel is mentally edging away the thin layers of the "might be" possibilities to expose the "is" nucleus to the critical reader's mind.

Why could the United States alone furnish demonstrations leading to neighborly relations? How could Canada have accomplished the task alone? If neither country, alone or together, could have conclusive evidence, how then could neighborly relations be established? If neighborly relations were necessary, of what importance were they for Canada, the United States, or for both countries? (Step 4).

In turn, each proposition is examined first for its own merit and then in relationship to the others. The outcome of the operations are verified to be either accepted as "the real" or rejected because they are not real according to the evidence (Step 5).

Conclusion

As mentioned earlier in this study, and as can be verified from the detailed application samples given, the structural steps in critical reading remain the same as presented in the order and content of process, operation, and outcome. The change is in the difficulty and complexity of the reading materials. Each structural step in this operation becomes increasingly more difficult and complex for the student to handle, thus necessitating greater and more extensive mental power. It is through these efforts and actions that teachers can enhance their students' abilities to read critically.

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